

COLUMBIA STATE COMMUNITY COLLEGE

2021 Governor's Investment in Technical Education (GIVE 2.0)

Program Title: Engineering Systems Mobile Classroom and Robotics Expansion

Lead Entity Name: Columbia State Community College

Fiscal Agent: Columbia State Community College

IN PARTNERSHIP WITH:

Workforce/Economic Development Agencies:

Maury County Chamber & Economic Alliance

Hickman County Economic & Community Development Association

Lawrence County Chamber of Commerce

City of Lewisburg Department of Economic Development

Wayne County Joint Economic and Community Development Board

Higher Education Institution:

TCAT Pulaski

LEA/School District Names:

Hickman County Schools

Lawrence County School System

Maury County Public Schools

Marshall County Schools

Employer Partners:

Columbia Machine Works

Custom Manufacturing Solutions

Fuel Total Systems

GCP Applied Technologies

General Motors

South Central Tennessee Workforce Alliance

Tennessee Distilling

Tennsco

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Funding requested:

**\$1,000,000**



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(Fiscal Agent)

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### **Abstract/ Project Summary**

Building on the success of our Engineering Systems Technology (EST) program in Fairview High School (Williamson County Schools), Columbia State Community College has expanded the program into Hickman County Schools (East Hickman High School) and Maury County Public Schools (Columbia Central High School and Spring Hill High School), with expansion underway in Lawrence County School System (Lawrence County High School and Loretto High School). Columbia State proposes further expansion of the program into school locations in our service area, as well as offering advanced EST courses in the current high schools and TCAT Pulaski. Grant funding will be utilized to purchase a box truck that will be transformed into the “Engineering Systems Technology Mobile Classroom”. The mobile classroom will be equipped with more advanced training equipment than exists at the current high schools and TCAT Pulaski. Funding will also be used to purchase and install basic training equipment in new locations, as well as upgrade equipment in current program high schools. Students complete coursework via online modules, then training and practice is completed on the equipment in the schools. An instructor from Columbia State would drive the Mobile Classroom to each program location during different days of the week so that the students would be able to train and practice on state-of-the-art equipment and technology where equipment applicable to the coursework is not available in the high schools. With a recent in-kind donation of three robots from General Motors to Columbia State, program students can also receive advanced robotics training at our Columbia campus.

Additionally, the AAS in Engineering Systems Technology requires students to enroll in a credit bearing internship experience. Therefore, in addition to making college a reality by bringing college to students who do not always have transportation, time, and resources to attend college and earn a degree, funding from this grant project would also increase the number of WBL opportunities in engineering and engineering related occupations.

## **SECTION 1: DEMONSTRATION OF NEED**

Columbia State Community College (CSCC) serves nine counties in southern middle Tennessee. Within its service area, CSCC has five campuses with an overall enrollment of over 5,500 students. The College has a solid working relationship with each school district in its service area, including the districts that will partner with CSCC on this grant proposal: Hickman County Schools, Lawrence County School System, Marshall County Schools, Maury County Public Schools, and Wayne County Schools. TCAT Pulaski, also within College's service area, will partner with CSCC on this project as well, and will also bring students from Giles County School System.

Columbia State confers Associate of Applied Science (AAS) and Technical Certificate in Engineering Systems Technology (EST). The EST program at CSCC has state-of-the-art, world-class training equipment that helps provide students with the skills needed to work with complex synchronized pieces of equipment. The program is currently in the process of receiving Smart Automation Certification Alliance (SACA) Silver Certification, which will allow us to increase the number of nationally recognized certifications we offer to students. Currently, through partnerships with area school districts, students at Fairview High School in Williamson County can graduate with an AAS degree or a technical certificate in EST, and students at East Hickman High School in Hickman County can earn a technical certificate. With dual credit and dual enrollment courses, practice and training on equipment, and work-based learning experiences, these students graduate high school prepared to enter the workforce with skills in electrical and mechanical components, electric motors, pneumatic and hydraulic controls, and programmable logic controllers (PLCs), or continue their education with a certificate or associates degree already in hand.

### **Drive to 55**

This project will provide the opportunity for students to earn college level credits that includes courses at both the freshman and sophomore levels by expansion of the EST program into



additional counties, TCAT Pulaski, as well as upgrading equipment in the current high schools. This will increase the number of students with either a certificate or an AAS degree and provide the skilled labor for the positions available in southern middle Tennessee job market. As stated above, currently students at Fairview High School can graduate with an AAS degree or a technical certificate in EST, and students at East Hickman High School can earn a technical certificate. No other local high schools in the proposed counties offer a college degree or courses toward a designed college degree. Funding from this grant proposal will make that a reality, just as it has been successfully implemented at Fairview and East Hickman high schools. An EST mobile classroom will be built to supplement classroom training, with more advanced trainers for senior level courses. The mobile classroom will allow students at East Hickman to continue from the technical certificate to receive their AAS when they graduate high school. Additionally, currently two high schools in Maury County (Spring Hill and Columbia Central) provide the freshman courses as dual credit. Funding from this grant proposal will help these students complete their AAS or certificate in Engineering Systems Technology by making available training equipment needed for course completion. Grant funding will be used to purchase equipment for Marshall County Schools Spot Lowe Technology Center and TCAT Pulaski to complement their technical programs, as well as purchasing equipment for installation in Columbia State's Clifton campus building in Wayne County. The box truck would travel to these locations as students advance to the higher-level courses later in their academic progress. Additional basic training equipment will be purchased for schools in the Lawrence County School System (Lawrence County and Loretto high schools) to augment existing inventory. Following the model at Fairview High School that was recognized for its success by [Governor Bill Lee on May 7, 2021](#), students in this program could begin the program their sophomore year. Therefore, it would be vital that the box truck travel to

these counties when students reach their senior year and are taking the more advanced courses. By partnering with these school districts, this grant proposal would increase the pipeline in the EST program to meet the growing local workforce demands, but also would positively impact Drive to 55 goals in multiple counties.

County data compiled by TSAC on the Drive to 55 website indicates that annually 107 additional students from counties to be served by this grant must enroll in college to increase the college-going rate by five percent.

|                 | <b>Postsecondary Enrollment Rate<sup>i</sup></b> | <b>Number of Additional Students Needed to Enroll in College to Increase the College-Going Rate by 5%<sup>ii</sup></b> |
|-----------------|--|--|
| Hickman County  | 57.6%  | 13   |
| Lawrence County | 66.1%  | 26   |
| Marshall County | 62.7%  | 20   |
| Maury County    | 62.5%  | 39   |
| Wayne County    | 72.0%  | 9  |
|                 | <b>Average 63.5%</b>                             | <b>Total 107</b>   |

Funding of the Engineering Systems Technology Mobile Classroom and Robotics Expansion grant project can increase the college-going rate. For this grant, the proposed target is to increase the “college going rate” by at least 75 annually and 150 over the course of the 30-month GIVE grant period. The target was derived given the following parameters: a.) average 2020 high school graduation rate for the five school district partners is 92.5%<sup>iii</sup> and b.) not all students will be interested in engineering as the most popular majors are health science related at CSCC.

Additionally, the overall target gives the grant project six months to purchase equipment and train the high school teachers and two full years of implementation. This target represents an increase in the college-going rate of approximately 3.7% as designated by the TN Drive to 55 for these counties. This will be accomplished by increasing high school student awareness and interest in engineering careers by providing college tours for the students or making presentations at their high schools. Teachers and counselors will be educated and able to help students entering the program.

**LEAP 2020: In Demand Occupations**

According to the LEAP 2020: In Demand Occupations, Engineering and Engineering-Related Occupations are “In Demand” in southern middle Tennessee.<sup>iv</sup> The below table reflects information on these occupations, which require either a postsecondary certificate or associates degree, as in the LEAP 2020 report.

| <b>Occupation</b>   | <b>Entry Level Wage</b> | <b>2019 Ratio of Postings to Hire</b> | <b>Projected Annual Job Openings over Next 10 Years</b> |
|---|-------------------------|---------------------------------------|---|
| Electrical and Electronic Engineering Technologists and Technicians | \$34,667                | 1.2                                   | 30  |
| Mechanical Engineering Technologists and Technicians                | \$37,884                | 2.3                                   | 20  |

According to the LEAP 2020 In-Demand Occupations report, more than 14,400 engineering technicians, drafters and mapping technicians were employed in Tennessee in 2019. This category of occupations is growing at a rate of 6% in Tennessee, compared to 1% nationally. Additionally, per the LEAP report, “Engineering-related occupations, like drafters, engineering and mapping technicians are found in the following industries: architectural, engineering, and related services; motor vehicle parts manufacturing; building equipment contractors; navigational, measuring, electromedical, and control instruments manufacturing; electrical equipment manufacturing; semiconductor and other electronic component manufacturing; rubber product manufacturing; plastic product manufacturing; and machinery, equipment and supplies merchant wholesalers, among others.”<sup>v</sup> The data is clear that opportunities abound for these students.

**U.S. Bureau of Labor Statistics**

According to the Bureau of Labor Statistics Occupational Employment and Wages, May 2020, Tennessee and the south central Tennessee region both show healthy employment for Maintenance Workers, Machinery and Industrial Machinery Mechanics<sup>vi</sup>.

| Occupation                     | Employment |      | Location Quotient* |      | Employment per 1,000 |      |
|--------------------------------|------------|------|--------------------|------|----------------------|------|
|                                | TN         | SCTN | TN                 | SCTN | TN                   | SCTN |
| Maintenance Workers, Machinery | 3,680      | 320  | 1.27               | 6.75 | 2.70                 | 3.16 |
| Industrial Machinery Mechanics | 8,610      | 570  | 1.07               | 2.02 | 2.97                 | 5.61 |

\*The location quotient is the ratio of the area concentration of occupational employment to the national average concentration. A location quotient greater than one indicates the occupation has a higher share of employment than average. As indicated above, south central Tennessee has a significantly higher share of employment in these categories than the state.

**MIT Living Wage**

Wage information for Williamson County, the most affluent county in Tennessee according to Forbes,<sup>vii</sup> was used as the benchmark to determine if the occupations associated with these programs constitute a living wage. This is an ambitious yardstick, and using this benchmark would clearly demonstrate the viability of graduates in the EST program. According to the MIT Living Wages Calculator, the annual income to constitute a living wage for one adult in Williamson County is **\$30,867**. According to the Bureau of Labor Statistics Occupational Employment and Wages, May 2020, annual mean wages in occupations suitable for EST graduates well exceed the Williamson County living wage:

| Occupation   | Annual Mean Wage |
|--|------------------|
| Maintenance Workers, Machinery                       | \$48,360         |
| Industrial Machinery Mechanics                       | \$54,630         |
| Industrial Engineering Technologists and Technicians | \$51,860         |

### TN Education and Workforce Maps

Tennessee Board of Regents TN Education & Workforce Maps provides information about higher education and job projections across the state. The job outlook for graduates of the EST program is strong, including two occupation groups categorized as “Highest Demand,” as indicated in the table below.

| Occupation                   | Projected Average Annual Job Openings | Projected Ratio of Graduates to Jobs | Projected Annual Job Growth Rate |
|------------------------------|---------------------------------------|--------------------------------------|----------------------------------|
| Machinery Maintenance        | 630                                   | 0.54                                 | 1.0%                             |
| Electrical Engineering Tech. | 65                                    | 0.37                                 | 1.6%                             |

### Jobs4TN.gov

Data from Jobs4TN.gov shows that there are numerous open positions across the state that would be suitable for an EST graduate. As of August 25, 2021, the following positions posted:

| Position                           | # of Available Jobs |
|------------------------------------|---------------------|
| Engineering Technician             | 233                 |
| Maintenance                        | 22                  |
| Industrial Technician              | 83                  |
| Mechanical Drafter                 | 33                  |
| Multi-Craft Maintenance Technician | 34                  |
| Control Systems Technician         | 78                  |
| PLC Programmer                     | 23                  |

### Additional Supporting Information

A 2021 Workforce Alignment Study completed by the Maury County Chamber and Economic Alliance and Boyette Strategic Advisors assessed the workforce in a nine-county labor market area inclusive of the counties to be served under this grant, and provided an alignment process to ensure efficient and effective use of workforce resources (Appendix C). Results from the study indicate that this grant project would contribute to the growing workforce demands of the area with well-paying employment opportunities. The study indicates Advanced Manufacturing as one of the leading opportunity sectors, with a projected 17% increase in jobs by 2025, and average annual earnings of \$67,897 in Maury County. The study also identified current and potential future skills gaps that the grant project would address. Industrial machinery mechanics were identified a current

skills gaps in the study through stakeholder input and data analysis. Additionally, the study identified manufacturing technology as a potential future gap.

Projections Central, a website sponsored by the US Department of Labor's Employment & Training Administration, includes long-term labor projections (2018–2028) for participating states. Occupations suitable for EST graduates are projected to increase significantly in Tennessee, as shown in the table below:

| <b>Occupation Name</b>                              | <b>% Change</b> | <b>Avg. Annual Openings</b> |
|---|-----------------|-----------------------------|
| Electro-Mechanical Technicians                      | 8.3%            | 50                          |
| Mechanical Engineering Technicians                  | 2.8%            | 110                         |
| Engineering Technicians, Except Drafters, All Other | 6.7%            | 160                         |

To illustrate the acuteness of the qualified applicant shortage, numerous regional companies have contacted CSCC looking for interns and/or employees from our EST program in the last few months including Tennessee Distilling LTD, JC Ford Company, TENNSCO, GCP Applied Technologies, and Universal Logic.

Within the past year and a half, over 2,000 new jobs and over \$4 billion worth of new capital investment has been announced in Maury County. In May, JC Ford Company, a leading manufacturer of automated equipment to the growing tortilla and tortilla chip industry, announced a \$30 million investment into a facility in Maury County. The Columbia State EST Program Director was contacted to help fulfill their immediate hiring needs. Once the facility expansion is completed, an expected 210 new jobs will have been created. In April, General Motors and LG Energy Solutions announced a \$2.3 billion dollar investment, the single largest capital investment expansion in state history, to build an Ultium Cells electric vehicle battery factory in Spring Hill, which is expected to create 1,300 new manufacturing jobs, opening up a new area of employment for future EST program graduates.

## **SECTION 2. PROJECT PLAN**

### **Overview**

Engineering Systems Technology at CSCC is a program that offers both online and experiential learning opportunities. The students will learn the concepts online and practice required skills using training equipment set up in the classroom and/or the EST mobile classroom.

EST courses offered at the high schools are either dual credit or provided via dual enrollment. For dual credit classes, the trained high school teachers teach the courses and the CSCC faculty gives laboratory examinations and final examinations. Students receive credit for their dual credit courses once they graduate from high school. The College also offers dual enrollment courses that are taught by CSCC instructors. Students first enroll in the program and as they complete the dual enrollment courses and they are recorded at CSCC toward their EST degree. Examples of those articulation agreements are shown in Appendix D.

The funds from this grant proposal will be used to purchase required training equipment for the high schools at partnering counties based on their inventory. The funds will also be used to purchase a box truck and more advanced trainers than currently available at the high schools. The advanced trainers, including robots, will be installed in the box truck. The box truck will be driven by CSCC instructor to the participating high schools in its service area on scheduled days so that dual enrolled student would be able to complete their lab work without traveling to the Columbia Campus. With a recent in-kind donation of three robots from General Motors to CSCC, program students as well as industry workforce, can also receive advanced robotics training on the Columbia campus of CSCC. Robotics training in the box truck and advanced robotics training with the GM donated robots at CSCC will significantly expand the EST program's capacity to train students in robotics.

The existing Advisory Board will oversee the program. Representatives to include CTE Directors of Hickman, Lawrence, Maury, and Wayne county school districts. Business

representatives from WBL partners that are not already on the Advisory Board will be invited to serve the Advisory Board as well as faculty from CSCC, TCAT Pulaski, and Chief Operating Officer from South Central Tennessee Workforce Alliance. The Advisory Board will serve a two-year term with option to represent up to six years. The Advisory Board will meet at least twice a year. The project director will initially chair and oversee the Advisory Board. The Advisory Board will determine sub-committees such as WBL.

The College, in partnership with high schools, TCAT Pulaski, and industry partners, will produce graduates with certificates or an AAS degree from CSCC, and would fill a growing workforce demand, as well as address current and potential future skills gaps. In turn, this will help each school district included in this grant proposal reach and surpass their college-going rate by increasing the number of students who complete a college credential by a projected 150 students for the duration of the grant to support the TN Drive to 55 initiative.

In this grant project, surveys will be administered to students, faculty, and industry partners to help measure the progress in this report. The Advisory Board representatives will play an important role in evaluating progress by reviewing the survey results. Pass rates for dual credit and dual enrollment courses will also be tracked, as will the proportion of students who are admitted and subsequently enrolled in the EST program at CSCC.

### **Project Timeline and Metrics**

| <b>Description</b>  | <b>Start Date</b> | <b>End Date</b> | <b>Metric</b>   |
|---|-------------------|-----------------|---|
| Form Advisory Board committee   | 12/1/2021         | 1/31/2022       | Hold the first meeting before the end date, determine sub-committee(s). |
| Complete Articulation with Marshall and Wayne counties, and TCAT Pulaski    | 12/1/2021         | 2/28/2022       | Articulations completed.  |
| Sub committees to work with industry partners and develop WBL opportunities | 1/1/2022          | 1/31/2022       | Approved proposals for WBL  |
| Purchase box truck.   | 1/1/2022          | 6/30/2022       | Possession of the box truck.  |



|   |           |            |   |
|---|-----------|------------|---|
| Place order for the Amatrol Trainers  | 12/1/2021 | 4/30/2022  | Trainers are received and installed at the high schools and box truck.                                |
| Training high school instructor for the dual credit courses EETC 1311 and ENST 1360 | 6/1/2022  | 7/31/2022  | Teachers receive certificates of completion.  |
| Install trainers inside the box truck   | 7/1/2021  | 7/31/2022  | Trainers installed. Timeline based on availability of materials and equipment.                        |
| Hire a new instructor   | 12/1/2022 | 4/30/2022  | New teacher will start on June 1st, 2022  |
| Advisory Board meeting  | 5/1/2022  | 5/29/2022  | Second Advisory Board to be held during this month  |
| WBL update  |           |            |   |
| Determine the days the box truck will be traveling to counties                      | 7/1/2022  | 7/31/2022  | Complete the schedule   |
| High school/TCAT students participate in program.                                   | 8/1/2022  | 5/31/2023  | 75 students participate in fall/spring semesters  |
| Mobile unit ready in Fall 2023  | 8/1/2023  | 5/31/2024  | Completion of mobile unit, ready to travel to school  |
| First Survey students, faculty, and industry partners                               | 10/1/2022 | 10/30/2022 | First feedback of the project from students and teachers  |
| Present data to the Advisory Board  | 11/2/2022 | 11/20/2022 | Third Advisory Board Meeting  |
| Sub committees to work with industry partners and                                   | 1/4/2023  | 1/29/2023  | Approved proposals for WBL with industry partners   |
| Second midterm survey of Students, faculty, and partners                            | 3/1/2023  | 3/31/2023  | Second feedback of the project from students and teachers   |
| Present data to the Advisory Board  | 5/3/2023  | 5/31/2023  | Forth Advisory Board Meeting  |
| Training high school instructor for the dual credit courses ENST 2361 and EETC 2361 | 6/1/2023  | 7/30/2023  | Teachers receive certificates of completion   |
| Review students graduation status in AAS or Certificate in EST                      | 7/5/2023  | 7/30/2023  | Evaluate instructors and students based on the student's grades and their progress toward CSCC degree |
| 75 students participate   | 8/1/2023  | 5/31/2024  | 75 students participate in fall/spring semesters  |
| Third Survey students, faculty, and industry partners                               | 10/4/2023 | 10/29/2023 | Third feedback of the project from students and teachers  |
| Present data to the Advisory Board  | 11/2/2023 | 1/19/2024  | Fifth Advisory Board Meeting  |

### **Recruitment of Underrepresented Student Groups**

CSCC is a recipient of TBR's Middle College Mechatronics Programs grant, which we utilize to pay students' tuition and fees not covered by the TSAC-sponsored Dual Enrollment grant. In

recruiting students to our program, we do highly encourage disadvantaged students to apply by explaining the no expense cost of this program and future employment opportunities that the program opens. In addition to no cost for the program, by providing training equipment in the high schools, as well as the EST mobile classroom that would travel to the schools, this program would be very attractive to nontraditional and underrepresented student groups who do not have transportation or cannot afford driving to a college site.

### **Governance and Accountability**

Governance and accountability for the grant will be primarily the responsibility of CSCC and specifically, EST Program Director Mehran Mostajir. Mr. Mostajir personally will oversee the budget and order equipment. He will work with the CTE program directors in each school district, monitor work-based learning opportunities in partnership with SCTWA for students in the program, and will monitor student supports such as transportation and scheduling.

### **Work-Based Learning**

This grant proposal requests funding to increase the associated WBL opportunities and revisiting the current EST internship course, ENST 2391, to align with the *WBL Framework*. The internship does have a set of learning outcomes that align with both the curriculum and the WBL placement. Additionally, the course already requires interaction with both career professionals and supervisors, and assesses student proficiency within the context of the learning outcomes.

With this grant project, the internship would require exploration of student interests and alignment with academic program choice, ensuring there were multiple opportunities to explore different aspects of potential career and sufficient time to develop employability and career skills.

Each student would be required to manage an e-portfolio. With guidance from WBL Coordinator and faculty advisor, the student would populate his or her e-portfolio with evidence of learning (e.g., Employability Skills Checklist) and proficiency with requisite professional and

employability skills and knowledge (e.g., self-assessment, reflection, work log). The TN WBL Implementation Guide will guide student experience. The students would also be required to post their gained experiences that show their understanding and reflection of the skills they gained as it relates to his or her interests and career goals.

At least one internship is a required credit course in the AAS in EST program. This means that 100% of the graduates will have had WBL opportunities when they graduate.

Further, WBL opportunities will be continued to be woven into the articulation agreements/curricular pathways. These WBL placements will require attendance at work site of at least 20 hours a week with a schedule that includes at least one full-day (8 hours). See Appendix B for Memorandum of Understanding from the industry partners. There will be flexibility in these requirements as the size and type of business of the industry partners varies greatly. Each employment site will provide supervision and evaluation of the student's performance. The proposed WBL placements can be:

1. If a student is taking dual credit and dual enrollment courses toward their degree at CSCC, then they can be placed at one of the industry partners with assistance from South Central TN Workforce Alliance (SCTWA). SCTWA supports employers of by assuming the costs such as payroll and Worker's Compensation. The students can complete their degree while still in high school or shortly after by completing the missing courses at CSCC.
2. The students will be taking their dual enrollment courses through TCAT Pulaski where they would be able to take some of their high school courses as dual enrollment. They will be able to receive credit upon completing their certificate at TCAT Pulaski and enrolling at CSCC. Students will be able to do their WBL as an intern by taking internship course that is a required for the EST program.

### **Equipment**

Equipment purchases will be integral for this grant project. Equipment will provide practical training aligned to support local advanced manufacturers workforce needs including electrical and electronic circuits, robotics, instrumentation, programmable logic controllers, motor controls and hydraulics/pneumatics.

### **Contingency Plan**

The EST program has faced challenges over the recent academic calendars due to COVID-19. Experiences throughout the pandemic would be applicable to other unexpected challenges. Zoom video conferencing can be utilized in teaching and lab work in the classes. For industry certifications, permission to teach the class via Zoom is possible. For the required internship, students who could not find an internship position due to COVID-19 teamed up in groups and completed three projects, which were presented during a visit by Governor Lee to Fairview High School in May, referenced earlier in our proposal. Training sessions are scheduled so students are not in labs all at once. The mobile classroom will include a ventilation system. Bringing teachers, counselors, and administrators together can be a challenge, but the success of our program at Fairview and East Hickman has not gone unnoticed, as demonstrated through the new partnerships established for this grant project. With this momentum and experience our expectation is the program and partners will successfully overcome unexpected challenges.

## **SECTION 3: STRENGTH OF PARTNERSHIPS**

Students participating in the EST program will benefit greatly from several existing partnerships, as well as new partnerships established for this grant project, including secondary and post-secondary articulations as well as WBL relationships with industry partners.

### **K-12 Articulations**

CSCC has existing articulations in EST for dual credit courses including EETC 1311 Electrical Circuit, EETC 2361 Fluid Power Systems, ENST 1360 Mechanical Power Transmission, and EETC

2361 Instrumentation Technology with Hickman County Schools, Lawrence County School System, Maury County Public Schools, and Williamson County Schools (Appendix D). Additional course articulations will be developed for the school systems new to this program.

### **Industry Partners**

CSCC has existing industry partners where our regular students or our high school students have the opportunity for work-based learning as interns. Often, interns become employees, so our industry partners view our relationship as mutually beneficial. Additionally, Engineering System Technologies currently has an advisory board with members from local industries that guides the program to prepare students to meet the needs of manufacturing employers.

### **TCAT Articulation**

CSCC and TCAT Pulaski have an agreement in support of this GIVE grant project for curricular pathways, as well as faculty and student participation in related activities.

### **Memorandum of Understanding**

Memorandum of Understanding (MOUs) from the participating economic development organizations, K-12 school districts, TCAT Pulaski, and industry partners outlining the roles and responsibilities of each party are available in the Appendix B.

### **Additional Evidence of Strength of Support**

In 2021, the Engineering Systems Technology program at CSCC was among the 10 colleges nationwide selected for the inaugural cohort of the Pathways to Innovation Business and Industry Leadership Team Academy (BILT). The BILT Academy will enhance CSCC's interactions with local employers to address workforce needs of the communities we serve, and also provide the opportunity to design coursework that is well-matched to the current needs of businesses in the area.

In 2016, the EST program at CSCC initiated the inaugural Maury County Manufacturing Day. In this initiative, a joint alliance between CSCC and the Maury County Chamber and Economic Alliance, businesses arrange for students from three high schools to visit their plants and learn about

manufacturing. The students also visit CSCC and learn how they can get job by continuing their academic careers by enrolling in postsecondary education.

#### **SECTION 4: BUDGET PLAN**

The Budget Plan is shown in Appendix A. Detailed information about the costs associated with each budget line is also provided.

#### **SECTION 5: SUSTAINABILITY**

This program will be self-sustaining after the duration of the 30-month GIVE Grant period. The Advisory Board will be represented by members that support and are already committed to the expansion of engineering and engineering related educational opportunities. Additionally, funds to support this grant project after the conclusion of the grant will be available via the increase in the number of dual enrollment student.

Students from the five counties participating in this grant will be dual enrolled during their junior and senior years at the high school. The expected number of dual enrolled students in the AAS in Engineering Systems Technology program and resulting revenues is based the grant proposal's target of an increase of 75 students annually that will attend college. This additional tuition revenue, approximately \$90,000, will contribute support to this project after the conclusion of the 30-month GIVE Grant period.

#### **SECTION 6: ECONOMIC STATUS ACKNOWLEDGMENT**

Wayne County Joint Economic and Community Development Board has provided a memorandum of understand to participate in the project. Our intention is to use grant funds to install equipment in the Columbia State Clifton campus building, in Wayne County, so that Wayne County Schools can participate.

| <b>GRANT BUDGET</b>  |  |                           |                                  |                          |
|--|--|---------------------------|----------------------------------|--------------------------|
| <b>GIVE Program Competitive Grant – Engineering Systems Technology Mobile Classroom and Robotics Expansion</b>     |  |                           |                                  |                          |
| <b>The grant budget line-item amounts below shall be applicable only to expenses incurred during the following</b> |  |                           |                                  |                          |
| <b>Applicable Period: BEGIN: 12/1/21 END: 05/31/24</b>   |  |                           |                                  |                          |
| <b>POLICY<br/>03<br/>Object<br/>Line-item<br/>Reference</b>  | <b>EXPENSE OBJECT<br/>LINE-ITEM<br/>CATEGORY <sup>1</sup></b>  | <b>GRANT<br/>CONTRACT</b> | <b>GRANTEE<br/>PARTICIPATION</b> | <b>TOTAL<br/>PROJECT</b> |
| 1, 2   | Salaries, Benefits & Taxes   | \$126,000                 | 0.00                             | \$126,000                |
| 4, 15  | Professional Fee, Grant & Award <sup>2</sup>   | \$117,000                 | 0.00                             | \$117,000                |
| 5, 6, 7, 8,<br>9, 10   | Supplies, Telephone,<br>Postage & Shipping,<br>Occupancy, Equipment<br>Rental & Maintenance,<br>Printing &<br>Publications | \$0.00                    | 0.00                             | \$0.00                   |
| 11, 12   | Travel, Conferences &<br>Meetings  | 0.00                      | 0.00                             | 0.00                     |
| 13   | Interest <sup>2</sup>  | 0.00                      | 0.00                             | 0.00                     |
| 14   | Insurance  | 0.00                      | 0.00                             | 0.00                     |
| 16   | Specific Assistance to<br>Individuals  | 0.00                      | 0.00                             | 0.00                     |
| 17   | Depreciation <sup>2</sup>  | 0.00                      | 0.00                             | 0.00                     |
| 18   | Other Non-Personnel <sup>2</sup>   | 0.00                      | 0.00                             | 0.00                     |
| 20   | Capital Purchase <sup>2</sup>  | \$720,000                 | 0.00                             | \$720,000                |
| 22   | Indirect Cost  | \$37,000                  | 0.00                             | \$37,000                 |
| 24   | In-Kind Expense  | 0.00                      | 0.00                             | 0.00                     |
| 25   | <b>GRAND TOTAL</b>   | <b>\$1,000,000</b>        | <b>0.00</b>                      | <b>\$1,000,000</b>       |

**Item Detail:**

## Salaries, Benefits &amp; Taxes

- Instructor salary at \$45,000 annually, with benefits and taxes at 40%.

## Professional Fee, Grant &amp; Award

- South Central Tennessee Workforce Alliance fees for work based learning opportunity support - \$117,000

## Capital Purchase

- Box Truck, plus modifications - \$150,000
- Mechatronics Learning System - \$165,342
- Robotics 1 Learning System - \$33,950
- (2) Electrical Learning Systems - \$7,324 each
- (2) Basic Electrical Machines Learning Systems - \$14,531 each
- (2) Basic Hydraulics Training Systems - \$21,686 each
- (2) Mechanical Drives Learning Systems - \$18,023 each
- (2) Level and Flow Process Control Training Systems - \$23,159 each
- (5) Electric Motor Control Learning Systems - \$19,158 each
- (4) PLC Learning Systems - \$10,966 each
- (2) Electro-Fluid Power Learning Systems - \$7,707 each
- Shipping and installation of equipment - \$46,200

## Indirect Costs

- Indirect costs at approximately 3.8% of direct costs - \$37,000



## **Appendix B – Memorandum of Understanding**

### Workforce/Economic Development Agencies:

- Maury County Chamber & Economic Alliance
- Hickman County Economic & Community Development Association
- Lawrence County Chamber of Commerce
- City of Lewisburg Department of Economic Development
- Wayne County Joint Economic and Community Development Board

### Higher Education Institute:

- TCAT Pulaski

### LEA/School Districts:

- Hickman County Schools
- Lawrence County School System
- Maury County Public Schools
- Marshall County Schools

### Employer Partners:

- Columbia Machine Works
- Custom Manufacturing Solutions
- Fuel Total Systems
- GCP Applied Technologies
- General Motors
- South Central Tennessee Workforce Alliance
- Tennessee Distilling
- Tennsco



Columbia | Mt. Pleasant | Spring Hill  
**MAURY COUNTY**  
Chamber & Economic Alliance

August 20, 2021

**RE: Columbia State Community College 2021 TN GIVE Grant Proposal**

This document attests Maury Alliance's support of Columbia State Community College's 2021 TN GIVE Grant proposal, Engineering Systems Mobile Classroom.

Upon the awarding of TN Give Grant funds associated with these grant projects and TBR approval, Maury Alliance will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

The Maury Alliance is especially interested in supporting this application as we frequently receive feedback from local advanced manufacturers regarding the need for more robust and aligned middle skills training programs to support the growth of their industries. In Maury County, twenty percent of the workforce is engaged in manufacturing, a percentage more than double the national average. According to EMSI, job growth in Maury County increased fourteen and half percent between 2015 and 2020. Furthermore, with over 2,000 new jobs and over \$4 billion worth of new capital investment announced within the past year and half, we anticipate Maury County to remain an engine for Tennessee's manufacturing growth into the foreseeable future.

As part of the support, Maury Alliance also acknowledges the 30-month duration of the TN GIVE Grant period of December 1, 2021 – May 31, 2024 and agrees to work with Columbia State within that TN GIVE Grant period.

The Maury Alliance greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Maury Alliance:

8/20/21

---

Travis Groth, Vice President — Economic Development

Date

Columbia State Community College:

9/7/2021

---

Janet F. Smith, Ph.D., President

Date



# HICKMAN COUNTY

T E N N E S S E E

Economic & Community Development Association

DATE: September 1, 2021

RE: Columbia State Community College 2021 TN GIVE Grant Proposal

This document attests Hickman County Economic & Community Development Association support of Columbia State Community College's 2021 TN GIVE Grant proposal, Engineering Systems Mobile Classroom.

Upon the awarding of TN GIVE Grant funds associated with these grant projects and TBR approval, Hickman County Economic & Community Development Association will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

As part of the support, Hickman County Economic & Community Development Association also acknowledges the 30-month duration of the TN GIVE Grant period of December 1, 2021 – May 31, 2024 and agrees to work with Columbia State within that TN GIVE Grant period.

The Hickman County Economic & Community Development Association greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Hickman County Economic & Community Development Association:

*Brenda L. Brock*

Brenda Brock, Executive Director

*9-1-2021*

Date

Columbia State Community College:

*[Signature]*

Janet F. Smith, Ph.D., President

*9/14/2021*

Date



T E N N E S S E E ' S  
**Lawrence County**  
CHAMBER OF COMMERCE

25B Public Square ■ Lawrenceburg, TN 38464

September 7, 2021

RE: Columbia State Community College 2021 TN GIVE Grant Proposal

This document attests Lawrence County Chamber of Commerce (the Chamber) support of Columbia State Community College's 2021 TN GIVE Grant proposal, Engineering Systems Mobile Classroom.

Upon the awarding of TN GIVE Grant funds associated with these grant projects and TBR approval, the Chamber will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

As part of the support, the Chamber also acknowledges the 30-month duration of the TN GIVE Grant period of December 1, 2021 – May 31, 2024 and agrees to work with Columbia State within that TN GIVE Grant period.

The Lawrence County Chamber of Commerce greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Lawrence County Chamber of Commerce:

\_\_\_\_\_  
President & CEO

9.7.21

\_\_\_\_\_  
Date

Columbia State Community College:

\_\_\_\_\_  
Janet F. Smith, Ph.D., President

9/14/2021

\_\_\_\_\_  
Date



## City of Lewisburg

131 East Church St.  
Lewisburg, TN 37091  
(931) 359-1544

Lewisburgtn.gov - Lewisburgtn.net  
Lewisburgtn.info - Lewisburgtn.dev  
Lewisburgtn.com - Lewisburgtn.biz

#makeitinMarshall - #investinmc



DATE: August 23, 2021

RE: Columbia State Community College 2021 TN GIVE Grant Proposal

This document attests The City of Lewisburg Department of Economic Development's support of Columbia State Community College's 2021 TN GIVE Grant proposal, Engineering Systems Mobile Classroom.

Upon the awarding of TN GIVE Grant funds associated with these grant projects and TBR approval, Lewisburg ECD will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

As part of the support, Lewisburg ECD also acknowledges the 30-month duration of the TN GIVE Grant period of December 1, 2021 – May 31, 2024 and agrees to work with Columbia State within that TN GIVE Grant period.

The City of Lewisburg's Department of Economic Development greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

City of Lewisburg | Department of Economic Development:

08/23/2021

Greg Lowe | Director — Economic Development [greg.lowe@lewisburgtn.gov](mailto:greg.lowe@lewisburgtn.gov)

Date

Columbia State Community College:

9/15/2021

Janet F. Smith, Ph.D., President

Date



September 14, 2021

RE: Columbia State Community College 2021 TN GIVE Grant Proposal

This document attests Wayne County Joint Economic and Community Development Board's (WCJECDB) support of Columbia State Community College's 2021 TN GIVE Grant proposal, Engineering Systems Mobile Classroom.

Upon the awarding of TN GIVE Grant funds associated with these grant projects and TBR approval, WCJECDB will help to endorse the networking opportunities among the TN GIVE Grant educational and industry partners.

As part of the support, WCJECDB also acknowledges the 30-month duration of the TN GIVE Grant period of December 1, 2021 – May 31, 2024 and agrees to work with Columbia State within that TN GIVE Grant period.

WCJECDB greatly appreciates the opportunity to partner with Columbia State Community College in support of this critically important effort.

Wayne County Joint Economic and Community Development Board:



John Hickman, Chairman of the Board

09-14-2021

Date

Columbia State Community College:



Janet F. Smith, Ph.D., President

9/14/2021

Date



**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND TCAT Pulaski  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021 – May 31, 2024**

This document attests TCAT Pulaski's support of Columbia State Community College's 2021 TN GIVE Grant proposal Engineering Systems Mobile Classroom.

Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, TCAT Pulaski agrees to the following:

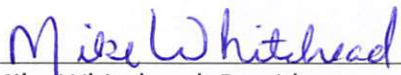
1. Sign articulation agreements with Columbia State for the following curricular pathways:
  - a. Industrial Maintenance Technology program at TCAT Pulaski/Engineering Systems Technology AAS degree at Columbia State.
  - b. Furthermore, Columbia State Mobile Classroom will be at the TCAT Pulaski to allow students to complete more advanced EST courses on site toward their AAS in Engineering Systems Technology degree.
2. Participation of TCAT Pulaski students in any of the above TN GIVE Grant proposals are upon student's completion of their certificate/diploma at TCAT Pulaski.
3. Participation in in-service faculty training and other activities funded by this grant
4. Host at least one faculty/ teacher in-service activity
5. Attendance of at least one faculty at one of four designated conferences. (Attendance funded by this TN GIVE Grant.)


Both the TCAT Pulaski and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.


IN WITNESS WHEREOF:

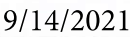
**TCAT Pulaski:**

  
Mike Whitehead, President

  
Date

**Columbia State Community College:**

  
Janet F. Smith, Ph.D., President

  
Date

## AGREEMENT BETWEEN

**Columbia State Community College AND  
Hickman County Schools  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests Hickman County Schools' support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Hickman County Schools agrees to the following:

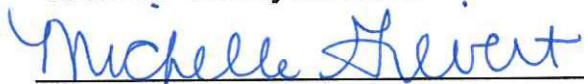
1. Participation of at least one High School Teachers in Technical training and other activities put forth in the grant
2. A representative designated by Hickman County Schools will serve on the Community Based Advisor for this grant
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Hickman County Schools.
4. Students will take dual enrollment course using the EST Mobile Classroom.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE Grant funding
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE Grant.)

Both the Hickman County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

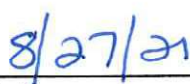
This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Hickman County Schools:**



County Director of Schools



Date

**Columbia State Community College:**



Janet F. Smith, Ph.D., President

9/7/2021

Date



**MEMORANDUM OF UNDERSTANDING BETWEEN**

**Columbia State Community College AND  
Lawrence County Schools  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021 – May 31, 2024**

This document attests Lawrence County Schools' support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN GIVE Grant funds associated with this proposal and TBR approval, Lawrence County Schools agrees to the following:

1. Participation of at least one High School Teachers in Technical training and other activities put forth in the grant
2. A representative designated by Lawrence County Schools will serve on the Community Based Advisor for this grant
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Lawrence County.
4. Students will take dual enrollment course using the EST Mobile Classroom.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE Grant funding
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE Grant.)

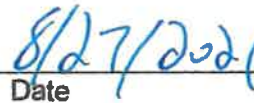
Both the Lawrence County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

**IN WITNESS WHEREOF:**

**Lawrence County School System**

  
Michael Adkins, Lawrence County Director of Schools

  
Date

**Columbia State Community College:**

  
Janet F. Smith, Ph.D., President

9/7/2021  
Date

## AGREEMENT BETWEEN

**Columbia State Community College AND  
Maury County Schools  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests Maury County Schools' support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Maury County Schools agrees to the following:

1. Participation of at least one High School Teachers in Technical training and other activities put forth in the grant.
2. A representative designated by Maury County Schools will serve on the Community Based Advisor for this grant.
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Maury County Schools.
4. Students will take dual enrollment course using the EST Mobile Classroom.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided because of TN GIVE Grant funding
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE Grant.)

Both the Maury County Schools and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Maury County Schools:**



County Superintendent of Schools (Designee)

9/3/21

Date

**Columbia State Community College:**



Janet F. Smith, Ph.D., President

9/14/2021

Date

Columbia State Community College AND  
Marshall County Schools  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024

1. Participation of at least one High School Teachers in Technical training and other activities put forth in the grant
2. A representative designated by Marshall County Schools will serve on the Community Based Advisor for this grant
3. Students will be taking dual credit courses based on an articulation between Columbia State Community College and Marshall County Schools.
4. Students will take dual enrollment course using the EST Mobile Classroom.
5. Work with Columbia State faculty in the placement of 12<sup>th</sup> grade Engineering Systems Technology (EST) students into WBL placements provided as a result of TN GIVE Grant funding
6. Attendance of at least one high school CTE teacher or CTE Director at one of four designated conferences. (Attendance funded by this TN GIVE Grant.)

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

### Marshall County Schools:

Date 9-1-21

**Columbia State Community College:**

9/14/2021  
Date



## Columbia Machine Works, Inc.

*"Committed to Providing the Best Solutions for Our Customers"*

MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND Columbia Machine Works  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024

This document attests Columbia Machine Works support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Columbia Machine Works agrees to the following:

1. Offer at least one work-based learning (WBL) experience for Columbia State Engineering Systems Technology student associated with this grant. The WBL student will be hired through the State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a starting hourly pay rate of \$12.50.
  - c. The student will work for a minimum of 20 hours a week with at least one full day (8 hours) each week.
  - d. The Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals.
  - f. Practice and demonstrate proficiency of knowledge & skills that are typically performed by a permanent professional in the field, demonstrate the ability to solve real work problems in a typical work setting, and participate in professional development or other opportunities available to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate the student in work setting
2. A representative designated by Columbia Machine Works could serve as the Community Based Advisor for this grant

Both Columbia Machine Works and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation the Family Educational Rights and Privacy Act (FERPA) and Columbia State Community College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Columbia Machine Works:**

John K. Langsdon, IV, Business Development Mgr.

Date

8-25-21

**Columbia State Community College:**

Janet F. Smith, Ph.D., President

9/7/2021

Date

1940 Oakland Pkwy  
Columbia, TN 38401

[www.columbiamachineworks.com](http://www.columbiamachineworks.com)  
[www.electrodehandling.com](http://www.electrodehandling.com)

931-388-6202

Custom Manufacturing Solutions, LLC  
1768 Highway 100  
Centerville, TN 37033

**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND  
Custom Manufacturing Solutions, CMS.  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests (CMS) support of Columbia State Community College's 2021TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, (CMS) agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours)
  - d. Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals
  - f. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by (CMS) could serve on the Community Based Advisor for this grant

Both (CMS) and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**COMPANY NAME:**

**CMS**

**08/26/2021**

Date

**Sign with title**

Butch Simmons.  
Operations Director 08/26/2021

**Columbia State Community College:**



Janet F. Smith, Ph.D., President

9/15/2021



## Fuel Total Systems Tennessee Corporation

102 Sam Watkins Blvd  
Mount Pleasant, TN 38474  
TEL: 615.989.9600

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**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND  
Fuel Total Systems.  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests Fuel Total Systems support of Columbia State Community College's 2021 TN GIVE Grant, Engineering Systems Mobile Classroom. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Fuel Total Systems agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours)
  - d. Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals
  - f. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by Fuel Total Systems could serve on the Community Based Advisor for this grant

Both Fuel Total Systems and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Fuel Total Systems:**

 *General Manager* 9-1-21  
Date

**Sign with title**

**Columbia State Community College:**

 9/7/2021  
Janet F. Smith, Ph.D., President Date



**MEMORANDUM OF UNDERSTANDING BETWEEN**  
**Columbia State Community College AND**  
**GCP Applied Technologies (GCP)**  
**TN GIVE GRANT: Engineering Systems Mobile Classroom**  
**December 1, 2021- May 31, 2024**

This document attests GCP support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, GCP agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours)
  - d. Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals
  - f. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by GCP could serve on the Community Based Advisor for this grant

Both GCP and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

*Jenni Cobb*

COMPANY NAME: GCP Applied Technologies (GCP)

*Lee Skelton* Plant Engineer 8/20/2021  
Date

Sign with title

Columbia State Community College:

*Janet F. Smith*  
Janet F. Smith, Ph.D., President 9/7/2021  
Date

**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND  
General Motors Spring Hill Manufacturing and UAW Local 1853 Local Apprentice Committee  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests General Motors / Spring Hill Manufacturing /Apprentice Committee's support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, General Motors / Spring Hill Manufacturing agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students assigned through our J.I.T (Journey person in Training) and/or Apprenticeship program, that are associated with this grant. Specifically, the WBL will
  - a. Be at least for 916 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. JI Ts and/or Apprentices will work for a minimum of 40 hours a week with at least one full day (e.g., 8 hours)
  - d. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular monthly intervals
  - e. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - f. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by General Motors / Spring Hill Manufacturing/ UAW Local 1853 Apprentice Committee could serve on the Community Based Advisor for this grant

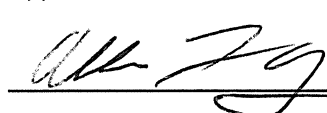
Both General Motors Spring Hill Manufacturing Apprentice Committee and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.


IN WITNESS WHEREOF:

**General Motors Spring Hill Apprentice Committee**


Apprentice Committee Chairman

 Date 8/31/2021

Apprentice Committee Coordinator

 Date 8/31/2021

**Columbia State Community College:**

 9/14/2021

Janet F. Smith, Ph.D., President

Date





South Central Tennessee  
Workforce Alliance

## AGREEMENT BETWEEN

**Columbia State Community College AND  
South Central Tennessee Workforce Alliance  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests South Central Tennessee Workforce Alliance's support of Columbia State Community College's 2021 TN GIVE Grant, **Engineering Systems Mobile Classroom**. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, South Central Tennessee Workforce Alliance agrees to the following:

1. Help screen student WBL student candidates as jointly determined by the TN GIVE Grant partners
2. Help in the evaluation of WBL student candidates readiness to work
3. Provide support to industry partners regarding the onboarding of hired WBL students (e.g., payroll, background checks, workers compensation)
4. Assist in the evaluation and progress of WBL students
5. Support at least two networking opportunities of the TN GIVE Grant partners
6. Assist in the development of one of this TN Grant partners conferences as per this TN Give Grant proposal
7. A representative designated by SCTWA will serve on the Center of WBL Industry Involvement Advisory Board (CWBL-II)

SCTWA and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**South Central Tennessee Workforce Alliance:**

  
Jan McKeel, President-SCTWA

9/9/2021  
Date

**Columbia State Community College:**

  
Janet F. Smith, Ph.D., President

9/15/2021  
Date

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5000 Northfield Lane, Suite 124 ♦ Spring Hill, TN 37174  
931.398.6000 ♦ fax # 931.486.0033 ♦ [www.sctworkforce.org](http://www.sctworkforce.org)

Board Chairman – Robby Moore

South Central Tennessee Workforce Alliance/Administrative Entity

TTY # 931.388.3869

**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND  
Tennessee Distilling Group  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests Tennessee Distilling Group support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Tennessee Distilling Group agrees to the following:

1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours)
  - d. Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals
  - f. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by Tennessee Distilling Group could serve on the Community Based Advisor for this grant

Both Tennessee Distilling Group and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.


IN WITNESS WHEREOF:

**Tennessee Distilling Group, LLC**

  
Mark S. MacKenzie, Managing Partner

  
Date

**Columbia State Community College**

  
Janet F. Smith, Ph.D., President

9/7/2021  
Date

**MEMORANDUM OF UNDERSTANDING BETWEEN  
Columbia State Community College AND  
TENNSCO LLC.  
TN GIVE GRANT: Engineering Systems Mobile Classroom  
December 1, 2021- May 31, 2024**

This document attests Tennsco LLC support of Columbia State Community College's 2021 TN GIVE Grant, *Engineering Systems Mobile Classroom*. Upon the awarding of TN Give Grant funds associated with this proposal and TBR approval, Tennsco LLC agrees to the following:

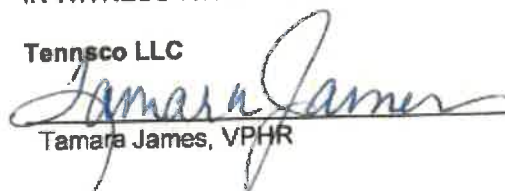
1. Offer at least one work-based learning (WBL) experiences for Columbia State Engineering Systems Technology students associated with this grant. The WBL students will be hired through State of Tennessee Work Force Development (WFD). Specifically, the WBL will
  - a. Be at least for 180 hours.
  - b. It will be a paid work experience with a suggested starting hourly pay rate of at least \$12.50
  - c. Students will work for a minimum of 20 hours a week with at least one full day (e.g., 8 hours)
  - d. Grant will pay up to \$6.25 per hour and workman's comp will be covered by WFD.
  - e. Employed students will have an assigned supervisor with professional and/or academic training that aligns with WBL that will evaluate the student at regular intervals
  - f. practice and demonstrate proficiency of knowledge & skills that typically performed by a permanent professional in field, demonstrate ability to solve real work problems in a typical work setting, and participate in professional development or opportunities to build on these skills.
  - g. Will allow scheduled site visits of the WBL Coordinator to evaluate student in work setting
2. A representative designated by Tennsco LLC could serve on the Community Based Advisor for this grant

Both Tennsco LLC and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on December 1, 2021 and ending on May 31, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

Tennsco LLC

  
Tamara James, VPHR

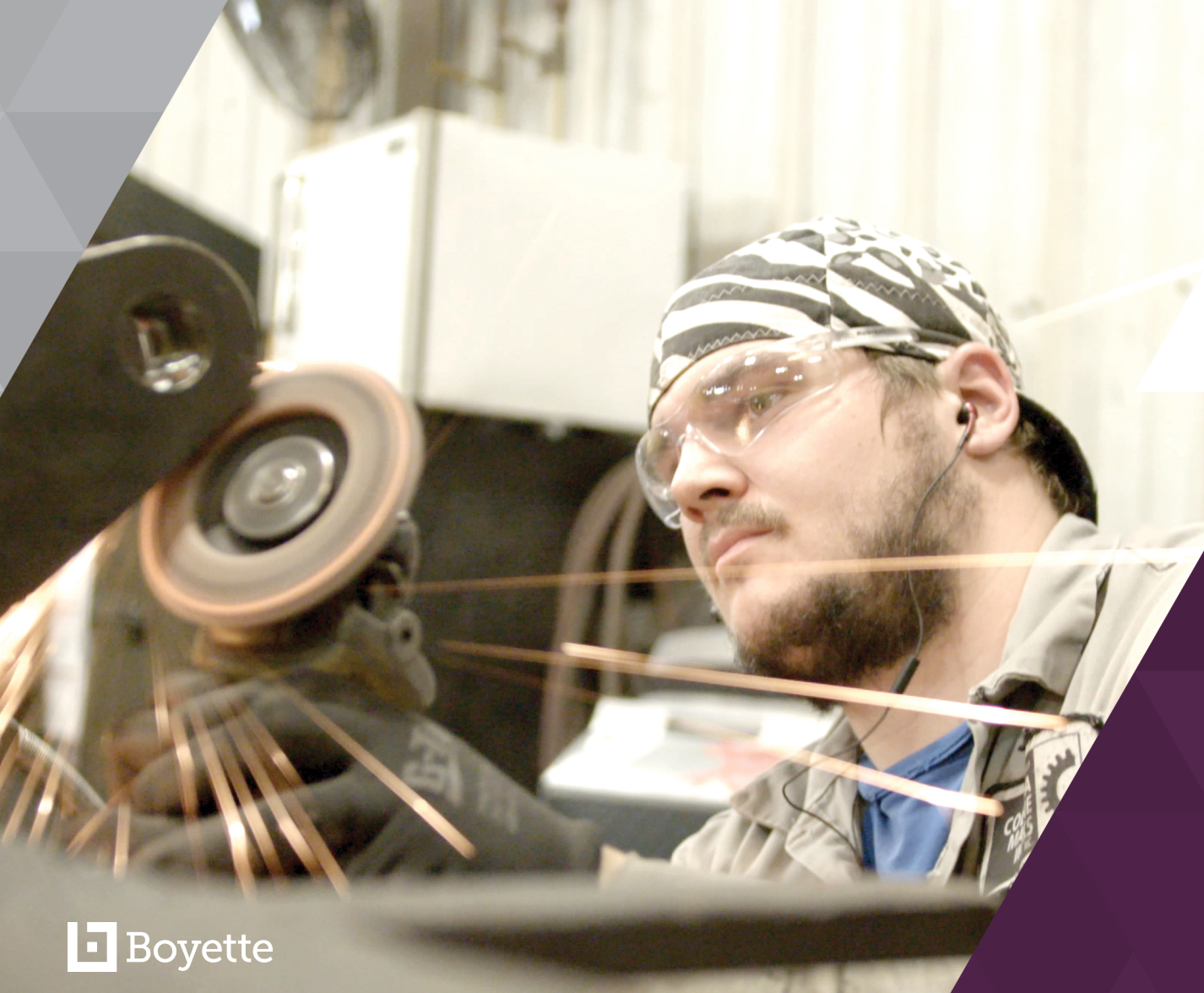
8.20.2021  
Date

Columbia State Community College:

  
Janet F. Smith, Ph.D., President

9/7/2021  
Date





# ALIGN MAURY

BUILDING TOMORROW'S TALENT TODAY

## Workforce Alignment Study Executive Summary

The Maury County Chamber and Economic Alliance (Alliance) engaged Boyette Strategic Advisors (Boyette) to complete a workforce assessment and alignment process to ensure that workforce resources are used efficiently and effectively to provide a future talent pipeline for Maury County employers. The ultimate goal of the project was to create a thoughtfully developed local delivery system that maximizes resources and results in a more highly skilled, competitive workforce.

Through analyzing a 60-minute drive time from Maury County and zip code data provided by Maury County employers, a nine-county Labor Market Area was defined to include Davidson, Giles, Hickman, Lawrence, Lewis, Marshall, Maury, Rutherford, and Williamson Counties, as seen in the map to the right.

### Maury Labor Market Area



## PROJECT GOALS

The following specific project goals were identified as this project began:

- Identify training program gaps
- Assess talent & skills demand for existing employers and potential growth sectors
- Ensure a diverse workforce that supports business recruitment
- Strengthen relationships between employers & workforce partners
- Align workforce resources with skills & occupational demand
- Create on-going task force to convene around workforce opportunities and challenges

## ASSET MAPPING

An asset mapping process was used to explore the overall workforce delivery system in Maury County. That exercise identified assets in the following categories:

- Connective Organizations – Business Services & Conveners
- Supportive Organizations – Outreach & Public Assistance
- Employment Services – Career Services & System Infrastructure
- Human Capital – Talent Development & Comprehensive Services

## KEY FINDINGS

- Employers are generally very satisfied with workforce skills found in Maury County, with 70 percent of employers being satisfied or very satisfied with the employees they hire in Maury County
- While employers believe the cost of labor is about right or less expensive compared to quality, availability is an issue for many
- Both total population and labor force continue to grow in the nine-county labor market region.
- Perceptions about careers in manufacturing and the skilled trades are somewhat negative, particularly among students
- Opportunities exist to strengthen relationships between employers and educators
- Barriers to employment are limited in the region, with childcare presenting the greatest challenge to employment for residents
- There are opportunities for better alignment of CTE courses at the high school level with compatible programs at CSCC and the TCATs, particularly related to manufacturing and information technology
- While a lack of attainable housing is often cited as a workforce issue, that is not the case in Maury County, where a significant number of new homes are under development and where available housing currently matches the needs of families living in or considering a move to the region

## WORKFORCE PROFILE

---

**8%**

POPULATION GROWTH (2015-2020)

**831,398**

LABOR FORCE

**\$65,305**

MEDIAN HOUSEHOLD INCOME

**68.08%**

LABOR PARTICIPATION RATE

**37.0**

MEDIAN AGE

**26.6** MIN

COMMUTE TIME

**44%**

ASSOCIATE'S DEGREE +

---

## SKILLS GAPS

Data analysis and stakeholder input for this project identified a number of skills and/or training gaps that exist in the Maury County workforce. These range from a lack of experience with basic office computer software to a need for increased leadership skills at all levels of the workforce. The most commonly discussed skills deficit in the Maury County workforce involves leadership skills. However, in further conversations, it is clear that employers are not referring to senior-level management roles but believe that leadership skills are important and valuable across all sectors and all levels of responsibility.

### CURRENT SKILLS GAPS

- Customer Service Representatives
- Assemblers & Fabricators
- Production Supervisors
- Inspectors, Testers, Sorters, Samplers & Weighers
- Welders
- Industrial Machinery Mechanics
- Bookkeepers
- Registered Nurses
- Leadership – All Levels
- General IT Skills
- Excel

### POTENTIAL FUTURE GAPS

- Information Technology
  - Cybersecurity
  - Logistics
  - Manufacturing Technology
- Biochemists
- Biophysicists
- Biological Technicians

## TARGET DATA

Target sector data was also defined and analyzed for the workforce alignment study, in addition to data for additional sectors that may provide future opportunities for job creation and investment. . The table below provides data for Maury County's opportunity sectors.

| Industry                     | 2020 Jobs | 2025 Jobs | Percent Change | Average Earnings |
|------------------------------|-----------|-----------|----------------|------------------|
| Advanced Manufacturing       | 1,263     | 1,477     | 17%            | \$67,897         |
| Automotive                   | 4,216     | 4,400     | 4%             | \$104,004        |
| Ceramics                     | 48        | 56        | 18%            | \$51,277         |
| Healthcare                   | 6,701     | 7,739     | 15%            | \$64,652         |
| Headquarters                 | 205       | 142       | -31%           | \$105,862        |
| Medical Device Manufacturing | <10       | <10       | 0%             | --               |
| Metal Fabrication            | 402       | 453       | 13%            | \$61,779         |
| Plastics                     | 257       | 296       | 15%            | \$64,080         |
| Production Technology        | 99        | 107       | 8%             | \$77,649         |
| Research & Development       | >10       | <10       | 0%             | --               |

Source: EMSI, Class of Worker Data, 2020.4

## STAKEHOLDER ENGAGEMENT

The workforce alignment study included interviews with employers, educators, and workforce partners, in addition to focus groups with post-secondary students and job seekers. Almost 50 individual stakeholders participated in those discussions, along with more than 1,100 stakeholders across Maury County who provided input into this project through a series of online surveys.

| Survey Audience         | Responses    |
|-------------------------|--------------|
| Employers               | 126          |
| Residents/Job Seekers   | 408          |
| High School Students    | 354          |
| Post-Secondary Students | 165          |
| High School Counselors  | 9            |
| <b>TOTAL</b>            | <b>1,062</b> |

## RECOMMENDATIONS

The recommended strategies that were informed by the research and data analytics are intended to encourage collaboration among all components of the workforce system, which will improve Maury County's competitive position in job creation and capital investment. The full workforce alignment study provides detailed explanation of each recommendation with and includes action items and best practice examples.

### Aligning Resources

#### *Create an ALIGN Workforce Team*

- ❑ Establish the ALIGN Team
- ❑ Identify Resources & Funding
- ❑ Create a Workforce Position at the Maury County Chamber and Economic Alliance

#### *Enhance Partnerships to Maximize Resources*

- ❑ Bring together workforce resources to facilitate more collaboration
- ❑ Move forward with development of a regional technology center
- ❑ Establish a one-stop approach to delivering workforce training and supportive services
- ❑ Develop a business training consortium
- ❑ Convene a business & industry workforce forum

### Educating for Opportunities

#### *Expand Work-Based Learning Programs at All Levels*

- ❑ Establish an ALIGN internship program
- ❑ Create an apprenticeship program for high-demand middle-skill occupations
- ❑ Create workplace exposure opportunities for educators

#### *Address Skills & Training Gaps of the Workforce*

- ❑ Create a Business Excellence Academy
- ❑ Establish a logistics and cybersecurity program
- ❑ Develop a partnership for an RN to BSN program
- ❑ Reframe manufacturing by showcasing high-demand occupations
- ❑ Explore the impact of automation on the future workforce

#### *Mobilize Community Leaders to Address K-12 Education Needs*

- ❑ Work with Maury County School District leadership to identify needs and determine how the broader community can support needed improvements
- ❑ Incorporate promoting K-12 education successes into all community-focused social media platforms

### Recruiting Talent

#### *Develop Diversity, Equity & Inclusion Initiatives That Engage And Support Minority Communities*

- ❑ Create a task force of minority leaders
- ❑ Explore the creation of a Leadership Institute offering focused on Diversity, Equity & Inclusion issues
- ❑ Ensure equitable entrepreneurial and start-up support services
- ❑ Capture, promote, and highlight successes

#### *Position Maury County as the South Central Tennessee Talent Hub*

- ❑ Launch a campaign to promote the new branding effort focused on establishing Maury County as an innovative talent hub
- ❑ Create a livability brochure
- ❑ Develop a "fam tour" for recruiting talent
- ❑ Develop an interactive map of the tour route
- ❑ Highlight Maury County employers that are hiring
- ❑ Focus recruitment efforts on young families

### Engaging the Workforce

#### *Expand & Enhance Re-entry Programs*

- ❑ Create a Military Transition Assistance Toolkit
- ❑ Work with employers to develop military occupation crosswalks
- ❑ Develop a "returnship" program
- ❑ Explore the development of a program to assist former addicts or incarcerated people
- ❑ Maximize skills of the underemployed workforce

#### *Develop Aging & Active Initiatives*

- ❑ Consider launching the Back to Work 50+ Initiative
- ❑ Encourage employers to consider flex-time scheduling for older workers

#### *Explore Childcare Needs*

- ❑ Conduct needs assessment

## **Appendix D – Articulation Agreements**

1. Hickman County Schools
2. Lawrence County School System
3. Maury County Public Schools
4. Williamson County Schools



**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Hickman County Schools  
For 2019-20—2023-24 Academic Year**

High school students within the Hickman County Schools System who pass the dual credit course(s) listed are eligible to be administered the corresponding end of course evaluation.

| <u>High School Course</u> | <u>College Course</u>                   | <u>College Credits</u> |
|---------------------------|---|------------------------|
| Mechatronics I            | EETC 1311 Electrical Circuit I          | 3                      |
| Mechatronics I            | EETC 1360 Mechanical Power Transmission | 3                      |
| Mechatronics II           | ENST 2361 Fluid Power Systems           | 3                      |
| Mechatronics II           | EETC 2361 Instrumentation Technology    | 3                      |

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive college credit at Columbia State Community College, in accordance with TBR's Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a diploma from a high school in the Hickman County Schools System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. Upon the student's request, the high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College Admissions office.
3. Other requirements as listed on Attachment A.

Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The corresponding college course, credit hours/ clock hours, and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Hickman County Schools System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2019 and ending on June 30, 2024. This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

Hickman County Schools:

DocuSigned by:  
*Michelle Gilbert*  
Michelle Gilbert, Director of Schools  
B67D51F0B9FE4A3...

2019-06-08 | 7:25 AM PDT  
Date

Columbia State Community College :

DocuSigned by:  
*Janet Smith*  
Janet F. Smith, Ph.D., President  
B5D923624D8F428...

2019-06-11 | 10:05 AM PDT  
Date

Tennessee Board of Regents:

DocuSigned by:  
*Flora W. Tydings*  
Dr. Flora W. Tydings, Chancellor  
33FA05002204B0...

DS  
RS

2019-06-11 | 3:17 PM CDT  
Date

## ATTACHMENT A

**ARTICULATION AGREEMENT COMMUNICATION**  
**Science, Technology, Engineering, and Mathematics**

**Engineering Systems Technology**

**Columbia State Community College**

**and**

**Hickman County Schools**

**STATEMENT OF INTENT**

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

**AGREEMENT**

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

| <u>High School Course</u> | <u>College Course</u>                   | <u>College Credits</u> |
|---------------------------|---|------------------------|
| Mechatronics I            | EETC 1311 Electrical Circuit I          | 3                      |
| Mechatronics I            | EETC 1360 Mechanical Power Transmission | 3                      |
| Mechatronics II           | ENST 2361 Fluid Power Systems           | 3                      |
| Mechatronics II           | EETC 2361 Instrumentation Technology    | 3                      |

**College Course Objectives/ Outcomes**

*Upon completion of EETC 1311, ENST 2361, EETC 1360, and EETC 2361, students will demonstrate the ability to:*

1. Design new electrical circuits and diagnose existing electrical circuits.
2. Design, connect and operate hydraulic and pneumatic circuits for machinery in industrial applications.
3. Design a mechanical systems involving v-belt, chains, spur gears, shafts, sprockets and bearings while everything is aligned to ensure wear free operation.
4. Demonstrate knowledge of process control systems to monitor and control fluid levels using manual and automatic controls.

**REQUIREMENTS**

*In addition to satisfactorily completing or being currently enrolled in the East Hickman high school course with a B or higher, the student must complete the additional requirements.*

- A grade of C or better in each course. Each course will follow the CSCC lesson plan and exam structure during the semester.
- Teachers at East Hickman must have a minimum of an Associate degree in teaching discipline.
- Teachers will be required to be trained at Columbia and/or AMATROL Campus.
- Classroom will have a maximum of 15 students but not less than 10 students.
- East Hickman will be responsible for the maintenance of the equipment.
- East Hickman will be responsible for purchasing the student's AMATROL e-learn licenses

**ASSESSMENT REQUIREMENT**

- A dual credit course will follow the exact course syllabus offered at Columbia State
- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Dual credit written exams will be monitored by a Columbia State instructor
- Lab exams will be done by either East Hickman or Columbia State Instructor

## ATTACHMENT A

### PROCEDURES

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Pass the assessment requirements for each course for which credit is requested.
4. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
5. Contact the Science Technology and Mathematics Division at Columbia State Community College to request the articulated credit.



## Community College Academic Contract Routing Confirmation Review and Approval

**TENNESSEE BOARD OF REGENTS**
**OBF-PURCH-CC-ACADEMIC** Revision: 6/2/2016

|                             |               |
|-----------------------------|---------------|
| Date Logged                 | 08/05/2020    |
| Institution Contract Number | 332.82.21-010 |
| TBR Contract Number         | 108779        |

|          |               |
|----------|---------------|
| Rush? no | Justification |
|----------|---------------|

|             |   |
|-------------|---|
| Institution | COSCC   |
| Contractor  | Lawrence County TN Schools                        |
| Purpose     | Dual Credit for Mechtroncs/Engineering Technology |

The signatures below indicate the attached contract has been reviewed and is recommended for approval

| STEP 1: INSTITUTION APPROVALS   |  |                           |
|---|--|---------------------------|
| Originator  | DocuSigned by:<br><i>Evin Brewer</i>             | 2020-08-05   8:15 AM PDT  |
| Department Approval   | 3157CCF9513849D                                  |                           |
| Institution's Purchasing and/or Contracts Office  |  |                           |
| STEP 2: TBR APPROVAL  |  |                           |
| Academic Affairs  | DocuSigned by:<br><i>Allana Hamilton</i>         | 2020-08-05   10:45 AM CDT |
| Contracts and Reporting   | DocuSigned by:<br><i>Marta Veronica Ferreira</i> | 2020-08-05   4:17 PM CDT  |
| General Counsel   | DocuSigned by:<br><i>J. Wayne Pugh</i>           | 2020-08-06   6:25 AM PDT  |
| STEP 3: THE AGREEMENT WILL BE FORWARDED TO APPROPRIATE VICE CHANCELLOR FOR REVIEW AND APPROVAL. |  |                           |

**Comments:**

Provide the name, title, and email of individuals that will be signing for the Contractor as well as individuals who need to be copied: Michael Adkins, Interim Director of Schools; michael.adkins@lcsc.us

Date Received by TBR: 08/05/2020

Contract Number: 108779  
(TBR internal use only)**TENNESSEE BOARD OF REGENTS  
CONTRACT SUMMARY SHEET**

If contract is submitted less than two (2) weeks before the effective date (1 month required for complex contracts), provide an explanation of the delayed submission: \_\_\_\_\_

1. Institution/System Office: COSCC Phone: 931-540-2527  
Direct Contract Questions to: Erin Brewer Fax: 931-560-406 Email: ebrewer8@columbiastate.edu
2. Contract with: Lawrence County TN Schools Address: 700 Mahr Ave., Lawrenceburg, TN 38464  
Contact Person: Michael Adkins Phone: 931-762-3581
3. Purpose of Contract (include type – i.e. Dual Service, Clinical, etc.):  
Dual Credit for Mechntrons/Engineering Technology
4. This contract is (check all that apply):  
☐ Drafted by TBR (School)/not Standard Form    ☐ Software License Agreement  
☒ TBR Standard Form Agreement    ☐ Vendor Generated Contract  
☐ Renewal of an Existing Contract    ☐ Vendor Contract with Amendment  
☐ Modification of Existing or Form Contract    ☐ Contract includes Confidential Research Agreement

**COPY OF AGREEMENT BEING AMENDED, EXTENDED OR PREVIOUS CONTRACT ATTACHED FOR REFERENCE AS WELL AS ANY EXHIBITS.**

5. Contract Terms:  
Term (i.e. 7/1/16 – 6/30/17, 1 year from execution, etc.): 7/1/2 - 6/30/25  
Possible Number of Renewals: 0 Lease: ☐ yes ☐ no Type: ☐ Revenue or ☐ Expenditure ☒ No Cost  
Payment Frequency: \_\_\_\_\_ Amount per Year: \_\_\_\_\_ Total Amount (w/possible renewals): \_\_\_\_\_
6. If this contract is a result of an RFQ/RFP, is the contract available for system-wide use: ☐ yes ☐ no
7. Check one: ☐ Competitive Process ☐ Non-Competitive Process\* Grant: ☐ yes ☐ no  
\* If competitive process is not used, attach supporting documentation, including the non-competitive justification form  
Select One
8. Non-Debarment Verification ([www.sam.gov](http://www.sam.gov)): ☐ yes ☐ no Date Verified: \_\_\_\_\_ 9. Ethnicity Code: \_\_\_\_\_
10. Contract Monitor (individual responsible for ensuring receipt of goods/services): Joni Lenig  
Frequency of monitoring (monthly, quarterly, semi-annually or annually): annually

**Signature of Institution/Central Office official certifying that he/she has read this Contract and recommends its approval.**\_\_\_\_\_  
**Signature (Department)****Signature of Institution/Central Office official certifying compliance with TBR Purchasing Procedures:**\_\_\_\_\_  
**Signature (Purchasing/Contracts Officer)**Form Completed by: Erin Brewer Date: 2020-08-05 | 8:15 AM

(TBR 03/17/16)

**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Lawrence County School System  
For 2020-21—2024-25 Academic Year**

High school students within the Lawrence County School System who pass the dual credit course(s) listed may sit for the corresponding end of course assessment(s).

| High Schools Course Name | College Course Name                                  | Credit Hours |
|--------------------------|--|--------------|
| Mechatronics I           | EETC 1311 Electrical Circuit I (2020-21)             | 3            |
| Mechatronics I           | ENST 2361 Fluid Power Systems (2020-21)              | 3            |
| Mechatronics II          | ENST 1360 Mechanical Power (2021-22)<br>Transmission | 3            |
| Mechatronics II          | EETC 2361 Instrumentation (2021-22)<br>Technology    | 3            |

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive dual credit at Columbia State Community College, in accordance with Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a high school diploma from the Lawrence County School System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. The high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College admissions office for credit awarding.
3. Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.
4. Other requirements as listed on Attachment A.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The college course, credit hours and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Lawrence County School System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational

Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2020 and ending on June 30, 2025.

This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Lawrence County School System:**

DocuSigned by:  
  
Michael Adkins, Interim Director of Schools  
2020-08-24 | 2:56 PM CDT  
Date

**Columbia State Community College :**

DocuSigned by:  
  
Janet P. Smith, Ph.D., President  
2020-08-24 | 1:24 PM PDT  
Date

**Tennessee Board of Regents:**

DocuSigned by:  
  
Horn W. Tydings, Chancellor  
2020-08-24 | 4:02 PM CDT  
Date



## Attachment A

**ARTICULATION AGREEMENT COMMUNICATION  
Mechatronics to Engineering Systems Technology**

**Columbia State Community College  
and  
Lawrence County School System**

**STATEMENT OF INTENT**

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

**AGREEMENT**

This agreement is effective as of the start of the 2020-2021 school year through 2025. This agreement may be terminated by either party by giving thirty (90) days written notice to the other.

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

| <u>High School Course</u> | <u>College Course</u>                   | <u>College Credits</u> |
|---------------------------|---|------------------------|
| Mechatronics I            | EETC 1311 Electrical Circuit I          | 3                      |
| Mechatronics I            | ENST 2361 Fluid Power Systems           | 3                      |
| Mechatronics II           | ENST 1360 Mechanical Power Transmission | 3                      |
| Mechatronics II           | EETC 2361 Instrumentation Technology    | 3                      |

College Course Objectives/ Outcomes

*Upon completion of EETC 1311, ENST 2361, ENST 1360, and EETC 2361, students will demonstrate the ability to:*

1. Design new electrical circuits and diagnose existing electrical circuits. (EETC 1311)
2. Design, connect and operate hydraulic and pneumatic circuits for machinery in industrial applications. (ENST2361)
3. Design a mechanical systems involving v-belt, chains, spur gears, shafts, sprockets and bearings while everything is aligned to ensure wear free operation. (ENST 1360)
4. Demonstrate knowledge of process control systems to monitor and control fluid levels using manual and automatic controls. (EETC 2361)

**REQUIREMENTS**

*The Lawrence County School System agrees to the following:*

- Each course will follow the Columbia State Community College course syllabus, lesson plan, and exam structure during the semester.
- High School Teachers have earned a minimum of an Associate degree in teaching discipline.
- High School Teachers will successfully complete training at Columbia and/or AMATROL Campus.
- High School dual credit class will have a maximum of 15 students but not less than 10 students.
- High School will be responsible for the maintenance of the equipment.
- High School will be responsible for purchasing the student's AMATROL e-learn licenses.
- Dual credit college assessment written exam will be monitored by a Columbia State instructor.
- Lab exams will be monitored by either Lawrence County High School or Columbia State Instructor.

**ASSESSMENT REQUIREMENT**

*In addition to satisfactorily completing or being currently enrolled in the Lawrence County School System high school course with a B or higher, the student must complete the additional requirements.*

- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Earn a grade of C or better in each high school course.
- Earn a 70% or higher on the College assessment to earn college credit.

**PROCEDURES**

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Pay \$25 fee for each course assessment.
4. Pass the assessment requirements for each course for which credit is requested.
5. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
6. Contact the Science Technology and Mathematics Division at Columbia State Community College to request the articulated credit.



## Community College Academic Contract Routing Confirmation Review and Approval

TENNESSEE BOARD OF REGENTS

OBF-PURCH-CC-ACADEMIC Revision: 6/2/2016

|                             |               |
|-----------------------------|---------------|
| Date Logged                 | 04/07/2021    |
| Institution Contract Number | 332.82.21-119 |
| TBR Contract Number         | 109343        |

|          |               |
|----------|---------------|
| Rush? no | Justification |
|----------|---------------|

|             |   |
|-------------|---|
| Institution | COSCC   |
| Contractor  | Maury County School System                              |
| Purpose     | Dual credit agreement for Engineering System Technology |

The signatures below indicate the attached contract has been reviewed and is recommended for approval

### STEP 1: INSTITUTION APPROVALS

|  |                                      |                          |
|--|--------------------------------------|--------------------------|
| Originator                                       | DocuSigned by:<br><i>Erin Brewer</i> | 2021-04-07   9:52 AM PDT |
| Department Approval                              | 3157CCF9513849D...                   |                          |
| Institution's Purchasing and/or Contracts Office |                                      |                          |

### STEP 2: TBR APPROVAL

|                         |  |                           |
|-------------------------|--|---------------------------|
| Academic Affairs        | DocuSigned by:<br><i>Russ Deaton</i>             | 2021-04-07   12:47 PM CDT |
| Contracts and Reporting | DocuSigned by:<br><i>Marta Veronica Ferreira</i> | 2021-04-07   9:00 PM CDT  |
| General Counsel         | DocuSigned by:<br><i>J. Wayne Pugh</i>           | 2021-04-08   5:42 AM PDT  |

### STEP 3: THE AGREEMENT WILL BE FORWARDED TO APPROPRIATE VICE CHANCELLOR FOR REVIEW AND APPROVAL.

#### Comments:

Provide the name, title, and email of individuals that will be signing for the Contractor as well as individuals who need to be copied:

President Smith, jsmith192@columbiastate.edu

Superintendent Mr. Michael Hickman, mhickman@mauryk12.org

Chancellor Tydings, flora.tydings@tbr.edu

Date Received by TBR: 04/07/2021

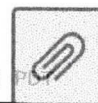
Contract Number: 109343  
(TBR internal use only)**TENNESSEE BOARD OF REGENTS  
CONTRACT SUMMARY SHEET**

If contract is submitted less than two (2) weeks before the effective date (1 month required for complex contracts), provide an explanation of the delayed submission: \_\_\_\_\_

1. Institution/System Office: COSCC Phone: 931-540-2527  
 Direct Contract Questions to: Erin Brewer Fax: 931-560-4106 Email: ebrewer8@columbiastate.edu
2. Contract with: Maury County School System Address: 501 W. 8th St., Columbia, TN 38401  
 Contact Person: Michael Hickman Phone: 931-388-8403
3. Purpose of Contract (include type – i.e. Dual Service, Clinical, etc.):  
Dual credit agreement for Engineering Systems Technology
4. This contract is (check all that apply):  
☒ Drafted by TBR (School)/not Standard Form ☐ Software License Agreement  
☐ TBR Standard Form Agreement ☐ Vendor Generated Contract  
☐ Renewal of an Existing Contract ☐ Vendor Contract with Amendment  
☐ Modification of Existing or Form Contract ☐ Contract includes Confidential Research Agreement

**COPY OF AGREEMENT BEING AMENDED, EXTENDED OR PREVIOUS CONTRACT ATTACHED FOR  
REFERENCE AS WELL AS ANY EXHIBITS.**

5. Contract Terms:  
 Term (i.e. 7/1/16 – 6/30/17, 1 year from execution, etc.): 07/01/2021 - 06/30/2026  
 Possible Number of Renewals: 0 Lease: ☐ yes ☐ no Type: ☐ Revenue or ☐ Expenditure ☒ No Cost  
 Payment Frequency: \_\_\_\_\_ Amount per Year: \_\_\_\_\_ Total Amount (w/possible renewals): \_\_\_\_\_
6. If this contract is a result of an RFQ/RFP, is the contract available for system-wide use: ☐ yes ☐ no
7. Check one: ☐ Competitive Process ☐ Non-Competitive Process\* Grant: ☐ yes ☐ no  
 \* If competitive process is not used, attach supporting documentation, including the non-competitive justification form  
 Select One
8. Non-Debarment Verification (www.sam.gov): ☐ yes ☐ no Date Verified: \_\_\_\_\_ 9. Ethnicity Code: \_\_\_\_\_
10. Contract Monitor (individual responsible for ensuring receipt of goods/services): Joni Lenig  
 Frequency of monitoring (monthly, quarterly, semi-annually or annually): annually

**Signature of Institution/Central Office official certifying that he/she has read this Contract and recommends its approval.**\_\_\_\_\_  
**Signature (Department)****Signature of Institution/Central Office official certifying compliance with TBR Purchasing Procedures:**\_\_\_\_\_  
**Signature (Purchasing/Contracts Officer)**Form Completed by: Erin Brewer Date: 2021-04-07 | 9:52 AM

(TBR 03/17/16)



**TENNESSEE BOARD OF REGENTS  
COMMUNITY COLLEGE  
DUAL CREDIT CONDITIONS AND AGREEMENT  
BETWEEN  
Columbia State Community College  
AND  
Maury County School System  
For 2021-22—2025-26 Academic Year**

High school students within the Maury County School System who pass the dual credit course(s) listed may sit for the corresponding end of course assessment(s).

| <b>High Schools Course Name</b> | <b>College Course Name</b>                           | <b>Credit Hours</b> |
|---------------------------------|--|---------------------|
| Mechatronics I                  | EETC 1311 Electrical Circuit I (2020-21)             | 3                   |
| Mechatronics I                  | ENST 2361 Fluid Power Systems (2020-21)              | 3                   |
| Mechatronics II                 | ENST 1360 Mechanical Power (2021-22)<br>Transmission | 3                   |
| Mechatronics II                 | EETC 2361 Instrumentation (2021-22)<br>Technology    | 3                   |

Students who receive the minimum passing score, determined by the College, on the respective end of course assessment(s) can receive dual credit at Columbia State Community College, in accordance with Early Postsecondary Opportunities Policy 2:01:00:05.

Upon conferment of a high school diploma from the Maury County School System, the student will notify the high school of his/her intent to attend Columbia State Community College. The high school will verify test scores and submit application for processing. For those students who meet all articulation requirements:

1. The student must be admitted to Columbia State Community College through the normal admissions and registration processes.
2. The high school will be responsible for ensuring all student documentation is forwarded to the Columbia State Community College admissions office for credit awarding.
3. Columbia State Community College faculty will be responsible for creating, administering, and assessing the dual credit end of course assessment.
4. Other requirements as listed on Attachment A.

Course credit will be awarded upon being officially admitted and enrolled at Columbia State Community College. The college course, credit hours and a grade of "Pass" will be shown on the Columbia State Community College transcript. Transfer of this dual credit to other institutions is at the discretion of the receiving institution.

Both the Maury County School System and Columbia State Community College shall comply with all applicable State and Federal laws and regulations, including without limitation with the Family Educational Rights and Privacy Act (FERPA) and College policies and guidelines in the performance of this agreement.

This Agreement shall be effective for the period commencing on July 1, 2021 and ending on June 30, 2026.

This agreement may be terminated by either party by giving written notice to the other at least thirty (30) days before effective date of termination.

IN WITNESS WHEREOF:

**Maury County School System:**

DocuSigned by:

  
Michael Hickman, Superintendent

2021-04-12 | 8:37 AM CDT

Date

**Columbia State Community College :**

DocuSigned by:

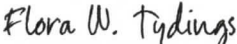
  
Janet F. Smith, Ph.D., President

2021-04-12 | 7:15 AM PDT


Date

**Tennessee Board of Regents:**

DocuSigned by:

  
Dr. Flora W. Tydings, Chancellor

DS



2021-04-12 | 9:44 AM CDT

Date

## ARTICULATION AGREEMENT COMMUNICATION Mechatronics to Engineering Systems Technology

### Columbia State Community College and Maury County School System

#### STATEMENT OF INTENT

This agreement, entered into by the parties, will provide methods of advance placement to students who complete the stated course. The purpose of this agreement is to encourage students to build on past learning experience and eliminate unnecessary duplication of instruction.

#### AGREEMENT

This agreement is effective as of the start of the 2021-2022 school year through 2026. This agreement may be terminated by either party by giving thirty (90) days written notice to the other.

The course(s) listed below has met the learning outcomes established by Columbia State Community College for the designated college courses.

| <u>High School Course</u> | <u>College Course</u>                                       | <u>College Credits</u> |
|---------------------------|---|------------------------|
| Mechatronics I            | EETC 1311 Electrical Circuit I (Fall assessment)            | 3                      |
| Mechatronics I            | ENST 2361 Fluid Power Systems (Fall assessment)             | 3                      |
| Mechatronics II           | ENST 1360 Mechanical Power Transmission (Spring Assessment) | 3                      |
| Mechatronics II           | EETC 2361 Instrumentation Technology (Spring Assessment)    | 3                      |

#### REQUIREMENTS

*The Maury County School System agrees to the following:*

- High School teachers will participate in meetings with Columbia State Community College faculty to review college courses minimum student learning outcomes, assignments, and exam structure.
- High School Teachers will or have successfully complete training at Columbia and/or AMATROL Campus.
- Students will be trained on equipment comparable to the college's AMATROL trainers.
- High School will be responsible for purchasing the student's AMATROL e-learn licenses.
- Dual credit college assessment written exam will be monitored by a Columbia State instructor.

#### ASSESSMENT REQUIREMENT

*In addition to satisfactorily completing or being currently enrolled in the Maury County School System high school course with a B or higher, the student must complete the additional requirements.*

- Students must work on their assigned online Learning Activity Packets (LAPs) and do their skills on the AMATROL trainers.
- Earn a grade of B or better in each high school course.
- Earn a 70% or higher on the College assessment to earn college credit. A variety of questions will be asked to assess knowledge, comprehension and application of concepts including demonstration of skills in a lab practicum.

#### PROCEDURES

*To participate in the articulation program, students must:*

1. Meet specific performance requirements as outlined above.
2. Attend the Columbia State Community College assessment day and meet assessment requirements as stated.
3. Complete application for permission to take Credit by Exam and pay Credit by Exam fee for each course assessment taken. Current fee for 2020-21 is \$25 per course.)
4. Pass the assessment requirements for each course for which credit is requested.
5. Meet all regular admissions requirements of Columbia State as published in the Columbia State Community College Catalog.
6. Provide official transcript of work completed at the high school.

7. Enroll at Columbia State Community College within two (2) years of the date of graduation from high school and successfully complete 12 semester hours of resident credit (excluding development studies courses).
8. Contact the Science, Technology, and Mathematics Division at Columbia State Community College to request the articulated credit.



## Columbia State Community College Contract Approval Form

**Instructions:** Attach this form to all contracts. Include three (3) originals of all contracts. Check all items listed below that apply, then route to the appropriate Vice President for approval. If the contract is not approved as it moves through the process, it will be returned to the last approving party with notes of concern for resolution of issues.

### To Be Completed by Contract Originator

Name of Contracting Party Columbia State Community College and Williamson County Board of Education  
 Short Description/Reason for Contract CSCC is to provide mechatronics-based education at Fairview High School for its students. WCS is to provide a facility for use and make available to its students CSCC equipment during the regular high school day with the desire to increase dual credit courses.  
 Obligations of Institution To provide part of the equipment needed to stock labs in order to fulfill requirements of the Dual Credit courses and Technical Certificate in Advanced Integrated Industrial Technology. Also, CSCC will provide access to the online lecture for dual credit WCS students in 2016-2017.  
 Obligations of Contracting Party WCS will make available to CSCC two (2) classrooms at Fairview to be used for CSCC classes during the 2016-2017 school year. Also, WCS will provide said access to Dual Credit enrolled WCS students after year one of the agreement.

- ☒ 1. The contract requires the expenditure of funds from fund/organization no. 230004/250007 in the amount of \$ 80,000.00.
- ☐ 2. Funds are being received from the contract in the amount of \$ \_\_\_\_\_.
- ☐ 3. No funds are involved in the execution of the contract.

Signature

3-2-16

Date

### To Be Completed by Appropriate Vice President

I have reviewed the attached contract: It is consistent with the mission and operational, curricular, and or student needs or requirements. I recommend it to the President for signature.

Signature

Date

### To Be Completed by Business Manager

I have reviewed the attached contract: It is in compliance with TBR Contract Guideline G-030 and funds are available to fulfill the contract. Based on these criteria, I recommend it to the President for signature.

Signature

Date

When approved return to

Erin Brewer

President's Approval

Columbia State

MAR 03 2016

President's Office

**AGREEMENT BETWEEN  
THE WILLIAMSON COUNTY BOARD OF EDUCATION  
and  
COLUMBIA STATE COMMUNITY COLLEGE  
for  
PROVIDING MECHATRONICS EQUIPMENT AND MECHATRONICS CLASSES  
AT  
FAIRVIEW HIGH SCHOOL**

This Agreement is entered into this the 15 day of March, 2016, by and between the **Williamson County Board of Education** of Franklin, TN (hereinafter "WCS"), and **Columbia State Community College** of Columbia and Franklin, TN (hereinafter "CSCC").

**WITNESSETH**

WHEREAS, CSCC desires to provide mechatronics-based education to its students at Fairview High School, 2595 Fairview Blvd, Fairview, TN (hereinafter "Fairview" or "the Premises"); and

WHEREAS, WCS desires to provide a facility for such use and make available to its students CSCC equipment during the regular high school day; and

WHEREAS, WCS and CSCC desire to facilitate increased high school participation in joint enrollment Mechatronics coursework in three Phases with a ultimate goal of an embedded AAS Degree as Phase III in 2018-19 (see appendix A) pending attainment of grant funding. Phase I consists of dual credit courses in 2016-17(see appendix B) and Phase II consists of an embedded Technical Certificate in 2017-18 (see appendix C);

WHEREAS, WCS and CSCC agree that it is appropriate for parties hereto to enter into an agreement for use of the facilities,

NOW, THEREFORE, in consideration of the premises and the mutual agreements contained herein, the parties hereby agree as follows:

1. WCS will make available to CSCC two (2) classrooms at Fairview to be used for CSCC classes during the 2016-2017 school year.
2. CSCC shall provide part of the equipment needed to stock labs in order to fulfill the requirements of the Dual Credit courses and the Technical Certificate in Advanced Integrated Industrial Technology (see appendix D).
3. CSCC shall provide WCS with a calendar and schedule of class times no later than thirty (30) days before said usage shall begin. WCS shall provide a building monitor during the times of CSCC use after regular WCS school hours, at its own expense.
4. CSCC will provide access to the online lecture for dual enrolled WCS students in 2016-17 and WCS will provide said access to Dual Credit enrolled WCS students after year one of the agreement.

5. WCS shall have the authority to use the said equipment at all times during its regular school hours and other times during which CSCC is not using them for its classes.
6. WCS's Maintenance Department shall have the authority to maintain said equipment and repair as needed.
7. CSCC shall have use of the Fairview High School main parking lot to the extent necessary for its use of the classrooms.
8. CSCC will not at any time use or occupy the Premises in violation of laws, ordinances, or regulations of any government or agency having jurisdiction over said premises.
9. All CSCC employees and contractors shall comply with the criminal background checks and other statutory requirements of its employees and contractors.
10. The parties hereto shall comply with the terms of the Family Educational Rights & Privacy Act (FERPA), 20 USC §1232g, the Children's Internet Protection Act (CIPA), 47 USC §254(h), and other federal and state laws applicable to students.
11. CSCC is a public institution of higher education and a member of the State University and Community College System of Tennessee governed by the Tennessee Board of Regents. As a state entity its liability arising from performance under this agreement shall be subject to and limited to those rights and remedies, if any, available under T. C. A. §§ 9-8-101 through 9-8-407. WCS is a political subdivision of the state, and, as such, its liability to third parties for injuries which may result from its performance under this agreement shall be subject to and limited to those rights and remedies, if any, available under the Tennessee Governmental Tort Liability Act, §§ T. C. A. 29-20-201, et seq.
12. Each party shall be solely liable for payment of its portion of all claims, liability, costs, expenses, demands, settlements, or judgments resulting from action or omissions of itself or those for whom it is legally responsible, relating to or arising under this Agreement.
13. This Agreement shall in no way be interpreted as creating an agency or employment relationship between the parties.
14. This term of this agreement shall begin upon execution of this agreement and terminate on May 31, 2017 and shall automatically renew perpetually for one-year periods beginning June 1, 2017 unless terminated by either party upon written notice no later than May 1 of each year.

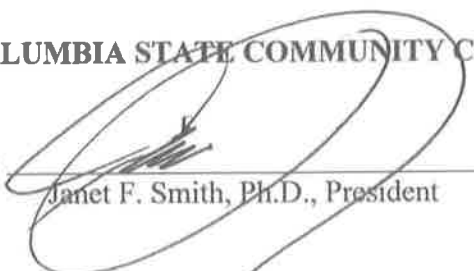
IN WITNESS WHEREOF, the parties have executed the above-written agreement on the date and year listed below, but effective as of the date first written above.

**WILLIAMSON COUNTY SCHOOLS**

By:   
Mike Looney, Ed.D., Superintendent

Date 4/23/15

**COLUMBIA STATE COMMUNITY COLLEGE**

By:   
Janet F. Smith, Ph.D., President

Date 3.10.16

Appendix A  
Phase III

ASSOCIATE DEGREE CREDITS TEMPLATE

Revised 2-23-16

| Subjects/Credits Needed | Ninth Grade<br>6.0 Credits | Tenth Grade<br>7.0 Credits                | Eleventh Grade<br>7.0 Credits             | Twelfth Grade<br>6.5 Credits                            |
|-------------------------|----------------------------|---|---|---|
| English 4.0             | English I                  | English II                                | English III                               | English IV/ <b>1010 (DE – 3 hrs)</b>                    |
| Math 4.0                | Algebra I                  | Geometry                                  | Algebra II                                | WCS College Algebra – State Dual Credit (3 hrs.)        |
| Science 3.0             | Biology I                  | Chemistry or Physics                      | Physical Science CSCC Dual Credit (4 hrs) | N/A   |
| Social Studies 3.5*     | World History              |   | U.S. History                              | <b>Economics (DE – 3 hrs)/U.S. Government</b>           |
| World Language 2.0      |                            | Spanish I                                 | Spanish II                                |   |
| Fine Arts 1.0           | Study Hall                 |   |   | FrHS Fine Art/ <b>CSCC Fine Art (DE – 3 Sem. Hrs.)</b>  |
| Physical Ed 1.5         | Wellness                   | P.E./*Personal Finance                    |   | <b>Computer Apps/Mechatronics (DE – 6 hrs)</b>          |
| Electives 4.0           | Technology Design          | <b>Mechatronics (Dual Credit – 6 hrs)</b> | <b>Mechatronics (DE – 6 hrs)</b>          | <b>Mechatronics (DE – 6 hrs)</b>                        |
| Electives 3.0           |                            | <b>Mechatronics (Dual Credit – 6 hrs)</b> | <b>Mechatronics (DE – 6 hrs)</b>          | <b>Mechatronics/Mechatronics Internship (DE – 6hrs)</b> |

Notes: Mechatronics 42 DE/DC hours  
Foundations of Technology completed in 8<sup>th</sup> grade

Additional college coursework 19 DE/DC hours  
3-hour Mechatronics Internship to be completed during summer following junior year

Total College Credit 61 Credit Hours

Total High School Credit 26.50 Credits (22.0 required)

This model would require a minimum of .50 credit be earned outside of the regular school day. High School Load could be lessened dependent upon student's beginning world language requirement in middle school or submission of a Foreign Language/Fine Arts Waiver (which would reduce total high school credits by 3.0) or a P.E. waiver (.50 credit).

**Speech 1010 is now required.**

## Appendix B

### Phase I

#### Mechatronics Dual Credit Articulation

Mechatronics I to Articulate with Columbia State courses as follows:

| <u>Course</u>                               | <u>Credit Hours</u> |
|---|---------------------|
| • AIT 1001 Basic Electricity                | 2                   |
| • AIT 1002 Power Development                | 1                   |
| • AIT 1003 Hydraulic/Pneumatic Fundamentals | 1                   |
| • AIT 1301 Principles of Instrumentation    | 2                   |

Mechatronics II to Articulate with Columbia State courses as follows:

|  |   |
|--|---|
| • AIT 1600 Workplace Safety                | 1 |
| • AIT 1101 Electrical Power Distribution   | 1 |
| • AIT 1102 Fluid Power Distribution        | 2 |
| • AIT 1201 Electrical Installation         | 1 |
| • AIT 1202 Piping & Pneumatic Installation | 1 |

#### Mechatronics I Learning Objectives

After the completion of the course, the student should be able to do the following:

- ✓ Define electricity. Connect/operate power supplies while demonstrating input and output devices such as switches, buzzers, solenoids, and motors.
- ✓ Use both digital and analog voltmeters along with ammeters in measuring volts and current in series and parallel circuits.
- ✓ Explain Ohm's Law and Kirchhoff's Law and the needed calculations to figure total power in series and parallel circuits.
- ✓ Demonstrate knowledge of electromagnetism, inductance, and capacitance in series and parallel circuits.
- ✓ Troubleshoot both a short circuit and an open circuit issue in a basic light circuit.
- ✓ Connect and operate a transformer and demonstrate how to calculate the secondary coil as well as the output voltage of the transformer
- ✓ Determine the Brush Polarity of a DC Generator Using a DMM
- ✓ Connect and Operate a DC Series Generator.
- ✓ Connect and Operate a Self-Excited DC Shunt Generator.
- ✓ Connect and Operate a Separately-Excited DC Shunt Generator
- ✓ Connect and Operate a DC Compound Generator
- ✓ Read a Pneumatic Pressure Gauge.
- ✓ Connect and Adjust a Pressure Regulator.

## **Appendix B**

### **Phase I**

- ✓ Drain a Pneumatic Filter.
- ✓ Connect a Pneumatic Hose That Uses Quick-Connect Fittings.
- ✓ Use a Tee to Connect Two and Three Circuit Branches Together
- ✓ Connect and Operate a Double-Acting Pneumatic Cylinder Using a 3-Position, Manually-Operated DCV
- ✓ Design a Multiple Cylinder Pneumatic Circuit
- ✓ Connect and Operate a Single-Acting Pneumatic Cylinder Using a 3/2 Manually-Operated DCV
- ✓ Connect and Operate a Uni-Directional Pneumatic Motor Using a 3-way, Manually-Operated DCV
- ✓ Identify Pneumatic Symbols
- ✓ Draw a Pneumatic Schematic from the Actual Circuit Connections on the Machine
- ✓ Connect a Pneumatic Circuit Given a Schematic
- ✓ Design a Multiple Actuator Pneumatic Circuit
- ✓ Read a Hydraulic Pressure Gauge
- ✓ Read the Liquid Level and Temperature in the Reservoir
- ✓ Operate a Hydraulic Power Unit
- ✓ Connect and Disconnect a Hydraulic Hose That Uses Quick-Connect Fittings
- ✓ Use a Tee to Connect Two Circuit Branches Together
- ✓ Connect and Operate a Double-Acting Hydraulic Cylinder Using a 3-Position, Manually-Operated DCV
- ✓ Design a Dual Cylinder Hydraulic Circuit
- ✓ Connect and Read a Flow Meter
- ✓ Connect and Operate a Needle Valve to Control the Speed of an Actuator
- ✓ Control the Speed of an Actuator Using a Manually-Operated DCV
- ✓ Connect and Operate a Bi-Directional Hydraulic Motor Using a 3-Position, Manually-Operated DCV
- ✓ Draw a Hydraulic Schematic from the Actual Circuit Connections on the Machine
- ✓ Connect a Hydraulic Circuit Given a Schematic
- ✓ Design a Multiple Actuator Hydraulic Circuit
- ✓ Determine the manipulated and controlled variables given process descriptions.
- ✓ Manually control the liquid level in a tank using open and closed loop methods.
- ✓ Identify the type and location using an instrument tag.
- ✓ Draw an instrument tag given device information.
- ✓ Identify P&ID line, valve,, actuator, and pump symbols
- ✓ Interpret instrument data using an instrument index.
- ✓ Power up a Honeywell UDC 3500 controller and perform a display and key test.
- ✓ Connect and operate a loop controller in the manual mode

### **Mechatronics II Learning Objectives**

After the completion of the course, the student should be able to do the following:

- ✓ Locate and apply OSHA Safety and Health standards, policies and procedures
- ✓ Utilize OSHA standards and regulations to supplement an on-going safety and health program

## **Appendix B**

### **Phase I**

- ✓ Identify common violations of OSHA standards and propose abatement actions
- ✓ Describe appropriate abatement procedures for selected safety and health hazard
- ✓ Obtain the 10 Hour General Industry OSHA Safety Training card
- ✓ Describe the Function of the Four Basic Parts of a Wiring System
- ✓ EMT Conduit Cutoff and Preparation
- ✓ Lay Out and Bend EMT with Proper Leg Length and Stub-Up.
- ✓ Bend IMC with a Mechanical Bender
- ✓ Cut and Connect Flexible Metal Conduit
- ✓ Select Wire Size and Type for an Application
- ✓ Use NEC Tables to Select the Proper Size Raceway for Same Size/Type Conductors
- ✓ Design and Install a Wiring System Given Specifications
- ✓ Connect and operate a needle valve to control actuator speed
- ✓ Design speed control circuits.
- ✓ Calculate the cylinder stroke given its size and a flow rate.
- ✓ Design a circuit to provide bypass flow
- ✓ Connect and operate a pressure sequence circuit.
- ✓ Design a hydraulic circuit that uses a pressure reducing valve
- ✓ Connect and operate a hydraulic 4/2 DCV
- ✓ Design a hydraulic sequence circuit using a cam operated hydraulic valve.
- ✓ Connect and operate a basic regeneration circuit
- ✓ Set up, adjust, and operate a cylinder synchronization circuit using flow control valves.
- ✓ Interpret an electrical print
- ✓ Determine the number of wires to run from a control panel to an operator station
- ✓ Wire an electrical panel
- ✓ Calculate the efficiency of a motor given input and output power.
- ✓ Select the correct DC motor for an application based on motor performance characteristics
- ✓ Connect and operate a split phase motor as well as a DC series generator
- ✓ Control the frequency of an alternator.
- ✓ Identify pipe function by color code
- ✓ Design and draw a piping schematic for a given application
- ✓ Use a pipe threading machine to cut threads on a pipe
- ✓ Install an expansion joint and pipe insulation
- ✓ Select and size plastic pipe for an application
- ✓ Determine bend locations and angles given a tubing layout drawing
- ✓ Determine hose length given a layout drawing and make the required hoses.
- ✓ Connect and operate a manually operated two-way valve which has threaded ports.
- ✓ Disassemble, repair, and test a two-way valve
- ✓ Disassemble and rebuild a Sloan valve.



# Appendix C Phase I

## TECHNICAL CERTIFICATE CREDITS TEMPLATE

2/8/2016

| Subjects/Credits Needed | Ninth Grade<br>6.0 Credits | Tenth Grade<br>7.0 Credits | Eleventh Grade<br>7.0 Credits | Twelfth Grade<br>6.5 Credits                    |
|-------------------------|----------------------------|----------------------------|-------------------------------|---|
| English<br>4.0          | English I                  | English II                 | English III                   | English IV/<br>6.5 Credits                      |
| Math<br>4.0             | Algebra I                  | Geometry                   | Algebra II                    | College Algebra – State<br>Dual Credit (3 hrs.) |
| Science<br>3.0          | Biology I                  | Chemistry or Physics       | ??????                        | N/A   |
| Social Studies<br>3.5*  | World History              |                            | U.S. History                  | )/U.S. Government                               |
| World Language<br>2.0   |                            | Spanish I                  | Spanish II                    |   |
| Fine Arts<br>1.0        | Study Hall                 |                            |                               | FrHS Fine Art/                                  |
| Physical Ed<br>1.5      | Wellness                   | P.E./*Personal<br>Finance  |                               | Computer Apps                                   |
| Electives<br>4.0        | Technology Design          | ?????                      | Mechatronics (DE –<br>6 hrs)  | Mechatronics (DE – 7<br>hrs)                    |
| Electives<br>3.0        |                            | ?????                      | Mechatronics (DE –<br>6 hrs)  | Mechatronics/Internship<br>(DE – 3hrs)          |

Notes: Mechatronics 22 DE hours Foundations of Technology completed in 8<sup>th</sup> grade

Additional college coursework 22 DE hours 3-hour Mechatronics Internship to be completed during summer following junior year

Total College Credit 22 Credit Hours

Total High School Credit 26.50 Credits (22.0 required)

This model would require a minimum of .50 credit be earned outside of the regular school day. High School Load could be lessened dependent upon student's beginning world language requirement in middle school or submission of a Foreign Language/Fine Arts Waiver (which would reduce total high school credits by 3.0) or a P.E. waiver (.50 credit).

## Appendix D

### Fall 2016 Start-up Equipment

|               |                                    |                  |           |
|---------------|------------------------------------|------------------|-----------|
| AIT 1001      | Basic Electricity                  | T7017            | \$5,000   |
| AIT 1002      | Power Development                  | 85-MT2           | \$31,694  |
| AIT 1003      | Hydraulic/Pneumatic Fundamentals   | 850-H1, 85-BP    | \$ 18,260 |
| AIT 1301      | Principles of Instrumentation      | T5552            | \$20,309  |
|               |                                    |                  |           |
| <b>Spring</b> | <b>2017</b>                        |                  |           |
| AIT 1600      | Workplace Safety                   | None needed      |           |
| AIT 1101      | Electrical Power Distribution      | 85-MT7           | \$16,500  |
| AIT 1102      | Fluid Power Distribution           | 85-IH (w/ 85-H1) | \$14,000  |
| AIT 1202      | Piping, Pneumatic and Installation | 950-PS1          | \$11,000  |
| AIT 1203      | Mechanical Installation            | 950-ME1          | \$14,932  |

**Total      \$131,776**

Appendix D

WCS Provided Equipment

|                |               |
|----------------|---------------|
| 85-MT2         | \$31,694      |
| 85-BP          | 4,760         |
| 85-IH          | 6,576         |
| <u>950-ME1</u> | <u>14,932</u> |
| Total          | \$57,962      |

Columbia State Provided Equipment

|                |               |
|----------------|---------------|
| T7017          | \$5,000       |
| 850-H1         | 13,549        |
| T5552          | 20,309        |
| 85-MT7         | 16,500        |
| <u>950-ME1</u> | <u>10,200</u> |
| Total          | \$65,558      |

(All prices do not include shipping and installation and are an estimate as of 2/22/2016)

Appendix E

Engineering Systems Technology Technical Certificate

Sample Academic Plan - Total Credit Hours: 19

Program Requirements - Students may be required to take additional Learning Support courses. Courses cannot be used more than once to satisfy program requirements.

First Year - Fall Semester - Credit Hours: 7

- [EETC 1311 - Electric Circuits](#) Credits: 3
- [ENST 2361 - Fluid Power Systems](#) Credits: 3
- [ENST 2199 - Special Topics: Industrial Safety](#) Credits: 1 OR [ENST 1350 Industrial Safety](#) (3 Credits)

First Year - Spring Semester - Credit Hours: 12

- [EETC 2361 - Instrumentation Technology](#) Credits: 3
- [ENST 1360 - Mechanical Power Transmission](#) Credits: 3
- [EETC 2333 - Industrial Electronic Controls](#) Credits: 3
- [EETC 2331 - PLC I](#) Credits: 3 OR [EETC 2332 PLC II](#)

Note(s):

Requirements for Certificates Include:

1. Total certificates hours must be at least 19
2. earn 25% of total program credits in residence at Columbia State
3. earn a GPA of at least 2.0 in courses required for the certificate.

Students and advisors should run a degree audit from myChargerNet each semester to confirm classes are applicable to the program of study.

For more information regarding graduation rates, the median debt of students who completed the program and other important information, review [Gainful Employment Disclosures](#) found under [Consumer Information](#).

For more information contact:  
Mehran Mostajir at [mmostajir@columbiastate.edu](mailto:mmostajir@columbiastate.edu) or 931.540.2711 or 931.398.8868  
Science, Technology and Math Division office at 931.540.2710 or [stm@columbiastate.edu](mailto:stm@columbiastate.edu)

Appendix E

Engineering Systems Technology, A.A.S.

Major in Engineering Systems Technology (A.A.S.)

Sample Academic Plan - Total Credit Hours: 62

Program Requirements - Students may be required to take additional Learning Support courses. Courses cannot be used more than once to satisfy program requirements.

First Year - Fall Semester - Credit Hours: 13

- [EETC 1311 - Electric Circuits](#) Credits: 3
- [ENST 1350 - Industrial Safety](#) Credits: 3
- [ENST 1370 - Manufacturing Processes](#) Credits: 3
- [General Education - Mathematics Requirement](#) Credits: 3 (Recommend [MATH 1130](#))
- [COLS 101 - Columbia State College Success](#) Credits: 1

First Year - Spring Semester - Credit Hours: 15

- [ENGL 1010 - English Composition I](#) Credits: 3
- [INFS 1010 - Computer Applications](#) Credits: 3
- [ENST 1360 - Mechanical Power Transmission](#) Credits: 3
- [ENST 2361 - Fluid Power Systems](#) Credits: 3
- [EETC 2333 - Industrial Electronic Controls](#) Credits: 3

First Year - Summer Semester - Credit Hours: 6

- [General Education - Humanities/Fine Arts Requirement](#) Credits: 3 (recommend [MUS 1030](#))
- [General Education - Social/Behavioral Science Requirement](#) Credits: 3 (recommend [PHED 2120](#))

Second Year - Fall Semester - Credit Hours: 16

- [PSCI 1030 - Survey of Physical Science](#) Credits: 4
- [EETC 2361 - Instrumentation Technology](#) Credits: 3
- [EETC 2332 - PLC II](#) Credits: 3
- [EETC 2350 - Integrated Robotics](#) Credits: 3
- [EETC 2311 - Power Technology](#) Credits: 3 OR [EETC 2399 Special Topics\\*](#) OR [ENST 2399 Special Topics\\*](#)

Second Year - Spring Semester - Credit Hours: 12

- [ENST 1311 - Computer Aided Design I](#) Credits: 3
- [ENST 2391 - Internship](#) Credits: 3
- [COMM 2025 - Fundamentals of Communication](#) Credits: 3
- [ENST 2382 - Fundamentals of Mechatronics](#) Credits: 3

General Education Requirements (Only When Option Noted Above)

<sup>1</sup>**History Requirement** - Select from [HIST 2010](#), [HIST 2020](#), [HIST 2030](#), [HIST 2310](#), [HIST 2320](#).

<sup>2</sup>**Humanities/Fine Arts Requirement** - Select from [ART 1035](#), [ART 2000](#), [ART 2020](#), [ENGL 2160](#), [ENGL 2860](#), [HUM 1010](#), [HUM 1020](#), [MUS 1030](#), [PHIL 1030](#), [PHIL 1040](#), [PHIL 2200](#), [THEA 1030](#). **Literature Options:** [ENGL 2055](#), [ENGL 2130](#), [ENGL 2235](#), [ENGL 2310](#), [ENGL 2320](#).

<sup>3</sup>**Mathematics Requirement** - Select from [MATH 1010](#), [MATH 1130](#), [MATH 1530](#), [MATH 1630](#), [MATH 1710](#), [MATH 1720](#), [MATH 1730](#), [MATH 1830](#), [MATH 1910](#).

<sup>4</sup>**Natural Sciences Requirement** - Select from [ASTR 1030](#), [BIOL 1010](#), [BIOL 1020](#), [BIOL 1080](#) (*must pair with non-biology course except for [BIOL 2010](#) or [BIOL 2020](#)*), [BIOL 1110](#), [BIOL 1120](#), [BIOL 2010](#), [BIOL 2020](#), [CHEM 1110](#), [CHEM 1120](#), [ESCI 1010](#), [ESCI 1020](#), [PHYS 2010](#), [PHYS 2020](#), [PHYS 2110](#), [PHYS 2120](#), [PSCI 1030](#).

<sup>5</sup>**Social/Behavioral Science Requirement** - Select from [ANTH 1230](#), [ANTH 1430](#), [COMM 1010](#), [ECON 2100](#), [ECON 2200](#), [GEOG 2010](#), [PHED 2120](#), [POLS 1010](#), [POLS 1030](#), [POLS 2025](#), [POLS 2035](#), [PSYC 1030](#), [PSYC 2130](#), [SOCL 1010](#), [SOCL 1040](#), [SOCL 2010](#).

Note(s):

\*The Topic could be Advanced Mechanical, Intermediate Hydraulic/Pneumatic Control, or Advanced Variable Frequency Drive.

This degree program is in compliance with the Common Course Curriculum Library for the A.A.S. in Engineering Systems Technology program as delivered by the Tennessee Board of Regents community colleges.

This degree program is not designed for transfer to a four year college or university. However, some agreements are in place that will allow credit to be given for a portion or the entirety of this degree path. Please check with the transfer institution or your advisor for specific details.

Students and advisors should run a degree audit from myChargerNet each semester to confirm classes are applicable to the program of study.

For more information contact:  
Mehran Mostajir at [mmostajir@columbiastate.edu](mailto:mmostajir@columbiastate.edu) or 931.540.2711 or 931.398.8868  
Science, Technology and Math Division office at 931.540.2710 or [stm@columbiastate.edu](mailto:stm@columbiastate.edu)

## Appendix F - References

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- <sup>i</sup> [https://www.tn.gov/content/dam/tn/education/data/2017-18\\_grad\\_rate\\_district.csv](https://www.tn.gov/content/dam/tn/education/data/2017-18_grad_rate_district.csv)
  - <sup>ii</sup> <https://driveto55.org/>
  - <sup>iii</sup> [https://www.tn.gov/content/dam/tn/education/data/2019-20\\_district\\_grad\\_rate\\_suppressed.csv](https://www.tn.gov/content/dam/tn/education/data/2019-20_district_grad_rate_suppressed.csv)
  - <sup>iv</sup> <https://tnecd.com/wp-content/uploads/2020/10/2020-LEAP-Report-10-27-2020.pdf>
  - <sup>v</sup> <https://tnecd.com/wp-content/uploads/2020/10/2020-LEAP-Report-10-27-2020.pdf>
  - <sup>vi</sup> [https://www.bls.gov/oes/current/oes\\_tn.htm](https://www.bls.gov/oes/current/oes_tn.htm)
  - <sup>vii</sup> <https://www.forbes.com/sites/andrewdepietro/2021/03/08/the-richest-counties-in-the-us-by-state/>